THE
VVELL-SPRING
OF
SCIENCES:

Which teacheth the perfect worke & practise of Arithmetick, *both in whole Numbers and Fractions: Set forth*

By

HUMFREY BAKER
Londoner.

Now newly perused, augmented, and amended in all the three parts:

Wherunto is also added certaine Tables of the agrement of the measures and waights of diuers places in Europe, the one with the other: as by the Table appeareth.

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TO THE RIGHT *Worſhipfull the Gouerners, Aſſiſtants, and the reſt of the* Companie of Marchants Aduenturers: *Humfrey Baker* Londoner, *wiſheth health with continuall increaſe of commodity by their worthy trauaile.*

IF the Knowledge of Arithmeticke (Right Worſhipfull) were of ſo ſmall profite in the life of Man, or ſo little vſed in our worldly Affaires, that it might bee well left, or but ſeldome frequented, it were well done by the Profeſſors therof to pen very long and Eloquent Orations, in ſetting forth the Commendation of the ſame. But ſince

experience hath taught to be true the old Prouerbe : *That where good wine is to ſell, there needs no garland to be hanged out.* Me thinketh they doe great iniurie to Arithmeticke, that ſeeke to heare the commodities thereof ſet forth in a ſhort Epiſtle, & ſurely they ouercharge me in laying ſuch a burthen on my backe as were too importable for the greateſt Orator. For the skill heereof is well knowne, immediately to haue flowed from the wiſedome of God, into the heart of man, whome hee hath created the chiefe Image and inſtrument of his praiſe and glory, reuealing himſelfe vnto him ſo far as hee iudged conuenient, whome notwithſtanding hee could not conceiue to remaine in the moſt ſecret miſtery of Trinity in vnitie, were it not by the benefit of moſt diuine skill in numbers, which skill as alſo the moſt full & effectuall knowledge of all other thinges vnſpeakble, God vſed in his wonderfull Creation of all the world out of nothing, which

he accompliſhed within the compaſſe of certaine number of dayes, expreſſing moreouer, what he made in euery day, and of certaine his creatures how many he made, as it appeareth in the booke of Geneſis written by ſpeciall Reuelation of the holy Ghoſt, wherein the diuine Maieſtie of God could not bee knowne vnto vs without the knowledge of numbers, nor *Moyſes* haue vnderſtoode what himſelfe had written. And *Salomon* the wiſeſt man that euer was conſidering the very depth of all things within his mind, to whome God hath giuen a greater gift of wiſedome, than to any man either before or ſince, doubted not to breake forth in theſe wordes, ſaying: Thou O Lord haſt diſpoſed all things in Meaſure, Number, and Waight, for thus it pleaſed him to iudge: who in another place teſtifieth how that he hath ſearched deeper into the cauſes & knowledg of al things than any other man in the world.

Theſe Teſtimonies (right worſhip-

full) doe manifeſtly teach vs, what we ought to thinke of the cauſe, and originall of Arithmeticke, and partly alſo how neceſſary it is in the life of man, that vnleſſe by nature wee haue ſome feeling and vnderſtanding therin, we are no better then beaſts, and in this reſpect worſe, for that wee retaine not that wherevnto wee are as ſpecially borne, as naturally they do, ſome to running, ſome to ſmelling, ſome to hearing, ſome to flying, and ſome to ſwimming. Take away Arithmeticke, wherein differeth the Sheapheard from the Sheepe, or the Horſe-keeper from the Aſſe? Surely but onely in ſhape and figure, which as the learned affirme, is a very ſlender cauſe of difference. Wherfore not without iuſt cauſe haue the auncient Fathers and Philoſophers ſingularly extolled the knowledge of Arithmeticke, dilligently trayning vp their youth therein, as in a Science moſt neceſſary of it ſelfe, conſidering the deepe deuiſes, the profound practiſes,

and

and cunning concluſions therin contained : and alſo that it is the Key and entrance into all other Arts and learning : as well approoued the Noble Philoſopher *Pythagoras*, who cauſed this inſcription to be written vpõ his ſchoole doore (where hee taught Philoſophie) in great Letters : *Nemo Arithmeticæ ignarus hic ingrediatur* : Let none enter heere that is ignorant in Arithmeticke : which ſaying, as it is proper and peculiar vnto all ſorts of men in the beginning and entrãce into all liberall knowledge and faculties to bee enſued and embraced, ſo ſurely aboue all other, it is (next after the word of God) moſt fit and neceſſary, that it ſhould bee written vppon your Schoole doores (Right Worſhipfull) whoſe Trade and trauaile is imployed in the Noble Traffique of Marchandize, wherin you haue need of continuall recourſe vnto this excellent Art. The daylie exerciſe wherof, hath ſo ſharpened your iudgmẽts, and ripened your vnderſtandings,

that moſt of you are become ſingular therein, both to deale that way your ſelues, and to iudge of other mens doings, And heerein I am ſure you are good witneſſes with mee how fooliſh & vaine is their opinió, which beſide your moſt commendable Affaires, ſuppoſe and affirme that Arithmeticke is of ſmall vſe vnto any other men, ſeeing that the Lawes of ſundry Realmes well inſtituted and guyded, haue deſeruedly accoũted for Fooles and vnfit members (to rule or deale in a common wealth,) all ſuch as wanted the skill of naturall Arithmeticke, depriued them both of Landes and liuing, which as it tendeth vnto no ſmall praiſe and credit of Arithmeticke, ſo am I conſtrained for breuity ſake, in few words to ouerpaſſe both that and others which might be ſayd in commendation thereof. Shortly admoniſhing your Worſhippes, that wheras in times paſt as is well knowne I had trauailed in a Booke in Engliſh

of

of that faculty, dedicated vnto you: being now informed to run ouer the ſame both amending and augmẽting it with ſundry Additions: I am ſo bold againe to attempt your Worſhippes with the acceptation thereof, hoping that as in fore-time yee haue taken it ſuch as it was, yee will now alſo daygne to receiue it, beeing in better caſe (I hope) than euer it was, a token of my good will, how bee it a ſimple thinge, wherein you may weygh the heart and not the gift, proceeding from ſuch a Fountaine, that if better skill and knowledge had been matched to my good meaning, it ſhould haue beene done otherwiſe, to the better contentation of your Worthyneſſe. And therfore in the meane ſeaſon vntill it pleaſe God to furniſh mee in ſuch ſort, I reſt in dayly prayer vnto him, to maintaine your Fellowſhip in happy ſtate, & to bleſſe your purpoſes with lucky ſucceſſe, to guide your voyages with

wiſhed

wiſhed increaſe, and to ſeaſon your doings with all kind of vertue, and to preſerue your liues with deſired health, to his will and pleaſure.

At London the 4. day

of Ianuary. 1584.

The

THE PROLOGVE
to the gentle Reader.

HAVING SOMEtime now twelue yeares (Gentle Reader) publiſhed in Print one Engliſh Booke of Arithmeticke containing (as I ſuppoſe) ſundry neceſſary and profitable documents for ſuch as are willing to attaine any knowledge therein, I haue beene often ſince that time, and of very late alſo, requeſted by ſundry of my friends, to peruſe the ſame worke, and as I ſhould now iugde it expedient, to adde ſomething more thereunto, and to amplifie the ſame. Which earneſt and friendly ſuite of theirs, for certaine iuſt cauſes ſeeming needfull vnto me,

me, ſurely I could in no wiſe deny. For when I perceiued the importunity of certaine ſtrangers, not borne within this land, at this preſent and of late daies, ſo farre proceeding, that they aduanced and extolled themſelues in open talke and writings, that they had attained ſuch knowledge and perfection in Arithmeticke, as no Engliſh man the like: Truely, me thought that the ſame report not onely tended to the diſpraiſe of our Countrymen in generall: But touched eſpecially ſome others and mee, that had trauailed and written publikely in the ſame faculty. For vnto this ſame effect they haue of late painted the corners and poſts in euery place within this Cittie with their peuiſh Bills, making promiſe, and bearing men in hand to beleeue that they could teach the ſumme of that Science in briefe Methode and compendious rules, ſuch as before their arriuall, haue not been taught within this Realme. Whoſe ſayings to be falſe, and writings vntrue, if I were thereto required by men of authoritie, I am well able to prooue, and that is

more

more (be it ſpoken without enuie, or thirſt of praiſe) euen within this ſame booke, if it may pleaſe thee to make triall, are generall precepts and Rules to be found, ſuch, as they can bring forth neither briefer nor better. But this is no rare thing, ſince in other matters of great importance, their attempts are too too perillous, and their deeds outragious, well deſeruing reſtraint and baniſhment; againſt one of whome, verily not of mine owne accord, but conſtrainedly, I haue beene enforced to ſharpen my pen, for that hee, as I heare ſay, continueth in diſpraiſe of our Nation, ſaying, that wee are vnskilfull in thoſe rules that he teacheth, and himſelfe excellent in the knowledge of Arithmeticke, wherein, if true tryall might be indifferent Iudge, I doubt not but hee would bee found to haue leaſt skill of a great many: of whome perhaps, if I ſhold write vpon report of others, I could ſay ſomewhat more which would (if it were true, and he knowne) redound vnto his vtter diſcredite, which for this cauſe I omit to doe, leaſt the crime of arro-

rogancy might bee thought to reſt within me, which I obiect againſt him, howbeit, thus much I dare affirme, that there are diuers in this honourable Cittie, who although they aduance and extoll not themſelues (ſo malapertly) as theſe ſort of men are accuſtomed to doe in all that they profeſſe, yet doe farre ſurpaſſe them, aſwell in the knowledge of numbers as in all other kinde of learning and skilfulneſſe. Another cauſe alſo there is of this preſent edition, as it ſeemeth to me very iuſt and neceſſary, for when a certaine wellwiller of mine purpoſing to ymploy ſome time in bettering his knowledge in Arithmeticke through the reading of this preſent booke, did certifie me, that he in peruſing the ſame had eſpyed ſo many errours committed in the printing, that hee could gather no truth thereby. I was not a litle mooued thereat, ſince that by diſorderi ng thereof, neither the worke retained his true meaning, neither could the lear ner attaine his deſired knowledge: and ſurely no maruaile, for as I am credibly informed,

med, ſince it paſſed out of my hands, it hath beene often times printed without the view of a skilfull corrector, vnto the great diſcredit of the Authour. Theſe and ſuch like conſiderations, vrging me forward and not forgetting the fruite (louing Reader) that may grow vnto thee heereby: I haue taken in hand both to amend and augment the ſame, ſeaſoning (as it were afreſh) all three parts of the worke, with diuers queſtions and examples, very neceſſary and profitable, hauing alſo for thy commodity added vnto the end of this booke diuers & ſundry tables of the agreement of meaſures and waights of ſundry places reduced to anequality, the one to the other. Vnto thee therefore my requeſt is thankefully to accept the ſame, and in good part, wiſhing well to him that trauaileth for thy benefit, not diſdaining it in reſpect of groſſeneſſe of the ſtile, or rudeneſſe of vtterance, ſince that this ſcience requirth not eloquence of writing, but plaineneſſe of teaching, and truth in working of diuers concluſions by numbers onely, deſiring thee, if thou bee

willing

willing to profite heereby: first, friendly to amend the faults that haue escaped in the printing of the same, and then to begin at the entrance of the booke, and so orderly proceeding forward to the end, not turning vnto the middest or last part thereof, vntill thou perceiuest well that which went before. And so doing thou shalt not onely attaine to the perfect knowledge of the whole effect: But be able also by thine owne labour and industry, to vnderstand all other bookes of Arithmeticke whatsoeuer: And thus I bid thee farewell hartily.

The

The Definition of Number.

NVMBER IS AS much to say, as a multitude composed of many vnities, as two is composed of two vnities, thrée is composed of thrée vnities, foure of foure vnities, fiue of fiue vnities, ten of ten, fourtéene of fourtéene, fiftéene of fiftéene, twenty of twenty vnities, &c.

And therefore an vnity is no number, but the beginning and originall of number, as if you doe multiplye or diuide an vnity by it selfe, it is resolued into it selfe without any encrease: But it is in number otherwise, for there can be no number, how great soeuer it bée, but that it

may continually bée encreased by adding euermore one vnity vnto the same.

Chap. 1.

Numeration.

Numeration is the ART whereby to expresse and declare the value of any Sum proposed: and is of Two kinds, the one gathereth the value of a summe proposed, and the other expresseth any summe conceiued by due figures and places, for the value is one thing, and the figures are another thing: and that commeth partly by the diuersity of figures, but chiefly of the places wherein they bée orderly set. And therefore you must first marke, that there are but ten figures or characters which are vsed in Arithmeticke, whereof nine of them are called signifying figures, and the tenth is called a Cipher, which is made

made like a o, and of it ſelfe ſignifyeth nothing, but if it be ioyned with any of the other figures, it encreaſeth their value, and theſe be they.

1 2 3 4 5 6
one, two, three, foure, fiue, ſixe,
7 8 9 0.
ſeuen, eight, nine, a Cipher.

Alſo you ſhall vnderſtand that euery one of theſe figures hath two values: One is alway certaine & hath his ſignification of his owne forme, and the other is vncertaine which he taketh of his place.

A place is called a ſeat or rome that a figure ſtandeth in, & how many figures ſoeuer are written in one Sum, ſo many places hath the whole value thereof. And that is called the firſt place (which is next toward the right hand) of any ſumme, and ſo reckoning by order towards the left hand, ſo that, that place is laſt, which is next the left hand. And contrariwiſe, when you expreſſe the value of the figures in any ſumme, you muſt *A place.*

begin at the left hand, and so reckon towards the right hand.

Euery of these nine figures (which are called signifying figures) hath his owne simple value when hée is found alone, or in the first place of any summe. In the second place toward the left hand, he betokeneth his owne value ten times. As 70. is seauen times ten, that is to say, seuenty: 80, is 8 times 10. ỹ is to say, Eighty. In the third place euery figure betokeneth his owne value a Hundreth times. As 700. in that third place betokeneth a hundreth times 7, that is to say, 7 hundreth. In the fourth place euery figure betokeneth his owne value a thousand times. As 7000, is seuen thousand, & 8000, is eight thousand. These foure first places must be had perfectly in mind, yea & that by hart as they say, for by the knowledge of them, you may expresse all kind of numbers how great soeuer they bée.

In the fift place, euery figure betokeneth his owne value ten thousand times.

times. As 70000, is ten times seuen thousand, that is to say, seuenty thousand. In the first place, euery figure standeth for his owne value, a hundred M. times. As 700000, is seuen hundreth thousand. The seauenth place, M, M, times, or a Million. As 7000000, is seuen M, M, or seauen Millions. And the eight place ten M, M, times, or ten Millions: so that euery place toward ỹ left hand, excédeth the former ten times. But now for the easie reading, & ready expressing orderly of any summe proposed, you shall practise this manner following. And for example. I propose this number, 76543265 8, in the which are ix. places. In the first place is 8, and betokeneth but eight, that is to say, once his owne value: In the second place is 5, and betokeneth ten times fiue, that is fifty: In the third place is 6, and betokeneth an hundreth times sixe, that is vi C. In the fourth place is 2, and that is two M. And 3, in the v place, is ten M times 3, that is xxx

M. So 4 in the first place is C thousand times 4, that is foure C, M. Then 5, in the seuenth place is a M, M, times 5, that is fiue M, M, or rather fiue Millions. And 6, in the eight place is six times ten Millions, that is, lx. Millions. And last of all vii. in the ix. place, is vii. C Millions. Now followeth the practise. First, put a pricke ouer the fourth figure, & so ouer the seuenth, and likewise ouer the tenth. And also ouer the 13, 16, or 19, if you haue so many, & so still leauing two figures betweene euery two pricks, and these romes from one pricke to another, are called Ternaries, then you must pronounce euery three figures from one pricke to another, as though they were written alone from the rest. And at the end of their value, ad so many times a thousand, as your number hath prickes: (that is to say) if there be but 1 prick, it is but 1 M: if 2 pricks, 1 M, M, or else a Million: if 3 pricks, one M, M, M, or a M. Millions. And so consequently

Ternarie

quẽtly of al other figures following) Then come likewise to the next 3. figures, & sound them as if they were apart from the rest, and adde to their value so many times Thousands, as there are prickes betwéene them and the first place of your whole number. And so doe by the next 3 figures following, and all the rest likewise: as in example, 45 1 234 678 567. The first pricke is ouer 8, in the fourth place, which is the place of a M. The second prick is ouer 4, in the seuenth place, which is the place of a M, M, or one Million: The third prick is ouer the 10 place, which is the place of a M, M, M, or of a M, Millions, as in the former example. Then for the expressing of this number by the value of euery figure, according to the place wherin they stand, you shall first begin at the last pricke ouer 1 and take it and the other two figures 5, and 4, which are behind the sayd 1, towards your left hand, and value them alone, & they are foure C li. M

M, M, or else CCCC li, M, Millions. Then take the other Thrée figures from 1, to the next prick toward your right hand, and value them as if they were apart from the other, and they are 234, which do signifie CCxxxiiii. Millions, or 234 M M. Then come to the third pricke ouer 8, and take the other two figures behind it, and reckon them likewise as if they were alone, and they are Six Clxxviii. M. And last of all, come to the other thrée figures which remaine, that is 567: and they are Fiue Clxvii. Thus the whole sum of these figures, is Foure Cli. M, Two Cxxxiiii. Millions, six Clxxviii. M, fiue Clxvii, as before.

Three kinds of number.

Diget.

Article.

Note also that whole number is diuided into thrée kinds, that is to say, Diget number, Article number, and Mixt or Compound number. The diget number, is al manner of numbers vnder ten, which are these Nyne figures, 1, 2, 3, 4, 5, 6, 7, 8, 9, of the which I haue spoken before. The Article number is any kind which hath

in

in the first place a Cipher, as this 0, and they may euer bee diuided iust by 10, without any remaine, as these 10 20, 30, 40, 50, 100, and all other such like. The Mixt or compound number containeth diuers and many Articles or at the least one article, and a diget, as 11, 12, 16, 19, 22, 38, 108, 1007, and so forth. And as any article number may bee made a compoũd, by putting thereto a diget, euen so likewise euery compound number, may be made an Article number, by adding thereunto 10.

Mixt or cõpound.

And

And heere followeth a Briefe reherſall of the order & Denominators of the places. And this ſhall be ſufficient for Numeration.

The order of the places.

4	3	2	1	0	1	2	3	4	5.
Tenth.	Ninth.	Eight.	Seuenth.	Sixt.	Fift.	Fourth.	Third place.	Second place.	First place.
Millions of millions.									Vnities.
	Millions of millions.								Tenths.
		Millions.							Hundreths.
			Millions.						Thousands.
				Millions.					Tenths of Thousands.
					Millions.				Hundreths of Thousands.
						Millions.			Millions.
							Millions of millions.		Tenths of Millions.
								Millions of millions.	Hundreths of Millions.

The Denominators of the places.

Chap. 2.

Addition in whole Number.

ADdition is as much as to bring together two sums or more into one, as if there were due to any man 223 li. by some one body: and 334 li. by another, and 431, by another: and you wold know how many pounds is due to the same man in all: these three summes shal you set down orderly the one vnder the other, wryting the greatest summe highest, and the next to the greatest vnder it, and the least summe vnder the last, in such sort, that the first figure of ỹ one sum towards your right hand, bee directly vnder the first figure of ỹ other, and the second vnder the second, and so forth in order.

When you haue thus done, draw vnder them a straight line, & they will stand thus.

431
334
223

Now beginne alwayes at the first places towards your right hand,

hand, and put together the thrée first figures of the first places of these thrée summes, and loke what commeth of them, write that vnder them beneath the line, as in saying 3, 4, and 1, being put together doe make 8: write 8 vnder thrée, as héere you sée.

431
334
223
8

And then goe to the second places of figures and do likewise: as in saying 2, 3, and 3 make 8, write 8 vnder 2, as héere you sée.

431
334
223
88

And doe likewise with the figures that bée in the third place, in saying 2, 3, and 4, are 9, put nyne vnder them, and so will your whole Summe appeare thus: whereby you may perceaue that those Thrée Summes being addad together, doe make 988 ri. And this is the Art of Addition accrding to his simplicity, when the sum of any place doth not exceéd a diget number. But in case the

431
334
223
988

the ſumme of any one place cannot be expreſſed by one figure, but by Two, you ſhall put the firſt of thoſe figures vnder the line, and kéepe the other in your mind, for to adde it vnto ỹ firſt figure of ỹ next place. And if the ſame next place cannot be aualued but by two figures, you muſt in like mäner put the firſt of thoſe figures vnder the line, and reſerue the ſecond for the other place next after, and thus muſt you do from one place to another, vntill you haue come to the laſt place, where, if it happen you doe find that the ſumme be of two figures, you muſt ſet them both downe becauſe it is the end of that worke, as in this example.

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  7346824 56
  4509323 45
   1346789 11
     467212 3
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  1203754 815
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Where the firſt figures are, 3, 1, 5, 6, which added together maketh 15, €

for

for that, that 15 is of two figures, I doe put the first figure 5 vnder the line, & kæpe the second figure (which is 1) in my mind, the which I must adde with the next figures of the second place, that is to say, with 2. 9. 4, & 5. the which together make 21, I write 1, vnder the line for ỹ second figure of that addition, that is to say, after 5: and I kæpe 2 to be added vnto the third place, the which with the other figures, 1, 8, 3, and 4, do make 18, therefore I put 8 next after 1, in the third place vnder the line, & kæpe 1 to be added vnto the figures of the fourth place, which is with 2, 7, 2, 2, the which with the 1 that I kæpe, do make 14: I set down 4 for the fourth figure (vnder the line) that is to say, behind 8: and I kæpe 1, to be added vnto the figures of the fift place, the which is 7, 6, 3, and 8, with ỹ 1 that I kæpe, maketh 25: I put 5 in the fift place, vnder the line next after 4: and I kæpe 2, in my mind, to be added with the figures of the fift place,

that

that is with 6,4,9, and 6,and that 2 which I kéepe, maketh 27: I wzite dowu 7 vnder the line in ẏ firſt place, and I kéepe 2, which I add with the figures in the ſeuenth place,and they make 13: I put dowue 3 vnder the line in the ſeuenth place, and adde 1, vnto the figures in the eight place, & they are 10: I do put 0 vnder ẏ line in the eight place, and then I adde 1, vnto the nynth place, that is to ſay, with 4 and 7,and they make 12: the which 12 I wzite at length vnder the line, becauſe it is the end of this Addition, and thus is to bé done of all ſuch like. And foz the eaſier vnderſtanding of that which wee haue ſpoken of Addition, you may examine theſe two other examples following, in the which the firſt hath theſe numbers, 3570, 2763, 579, & 28: which being added together, doe make this number 6940, and in the ſecond example,doth reſult this nũber 51683, by adding together of theſe numbers 47630,3756,272,25, as héere vnder wzitten.

wzitten.

The numbers	3570	47630
to be added.	2763	3756
	579	272
The line put	28	25
betweene.		
The ſumme of	6940	51683
this Addition		

Additon of li. s. d.

But if I haue any ſummes which are compoſed of diuers kindes of denominations, as 25 li. 17 s. 0 d. & 14 li. 13 s. 8 d. and 16 li. 19 s. 7 d. to be added together. I muſt firſt ſet downe all the ſaid Summes the one vnder the other, as hére you ſée: placing the title of pounds right vnder the pounds, the ſhillings vnder the ſhillings, and the penies vnder ẏ pennies, képing likewiſe

	li.	s.	d.
	25.	17.	4.
	14.	13.	8.
	16.	19.	7.
	57.	10.	7.

the

the due order of their places, in each denomination. And then I begin at the least denomination which are penies: And I say thus, 4 and 8 make 12, and 7 make 19 d: that is 1 s & 7 d. I set downe 7 vnder the line against the place of penies, and I do kéepe in my mind 1 s. to bée added vnto the place of shillings: This done, I procéed to the sayd place of shillings saying, 1 s. that I kéepe & 7 s. are 8, and 3 are 11, and 9 doe make 20: I put 0 vnder the line against 9, and do kéep 2 in my mind: Comming then vnto the tens of shillings, I say 2 that I kéepe, and 1 make 3, and 1 make 4. and 1 make 5; which are 5 tens of shillings, that is to say, 2 li. and 1 ten ouer, the which 1 I put behind the 0 towards my left hand vnder the tens of shillings, and I doe kéepe two li. in my mind, then I come to the place of pounds, and say 2 li. that I kéepe, and 5 are 7, and 4 are 11, & 6 do make 17 li. I do set 7 li. vnder the line against 6, and doe kéepe 1 in my

mind, then coming vnto the ten of pounds, I say 1 that I keepe and 2, are 3, and 1 are 4, and 1 do make 5: the which I write downe vnder the line behind the 7: And so is this Addition ended: And then the said three summes being added together, doe amount to 57 li. 10 s. 7 d. And thus is to be done of all other summes, of any other denominations.

Other examples.

225. 12. 6.	5678. 13. 9.
47. 3. 9.	608. 00. 10.
38. 18. 7.	400. 17. 11.
5. 00. 8.	56. 18. 8.
	9. 12. 7.
316. 15. 6.	6754. 03. 09.

Of

Chap. 3.

Of Subſtraction in whole Number.

SUbſtraction teacheth how you ſhall ſubſtract one leſſer number frō a greater and ſheweth what there doth remain after that you ſhall haue ſubſtracted the ſame, I ſpeake not of the ſubſtracting of one equall nūber, from another equall vnto it, for the facility therof requireth no rule.

In Subſtraction are found three numbers, the one is the number from the which the Subſtraction is made. The ſecond is the nūber that is to be ſubſtracted, and the third is the number which remaineth after ỹ ſubſtraction is ended. As when I would ſubſtract 25 from 40: The ſaid 40 is the number from the which the ſubſtraction is made, & 25 is ỹ number to bee

substracted, & 15 is the number which remaineth after you haue ended the substraction: héere followeth the practise. You shall put the lesser number vnder the greater in such sort that euery figure of the one number, may answere vnto euery figure of the other, orderly according to their places, and then draw a right line vnder those two numbers as you did in addition. Then must you begin at the right hand, and take the first figure of the vndermost number, and substract that from the first figure of the vppermost number ouer it, and that which remaineth you must set vnderneath the line, right vnder the figure which you haue substracted: then afterward take likewise the second figure of thenethermost number, and abate that also from the second figure of the higher number: the third from the third, and so forth of all the rest till you come to the end, putting alwayes the remaine of euery figure vnder the line in his due order and

place,

place, as by example, I will substract 2345, from 9876, after that I haue set them downe accoꝛding to the manner afoꝛesaid. Then beginning at the first place next to my right hand, I take first 5 from 6, and there resteth 1 : the which 1 I set vnder the line right against 5. Secondly I substract 4, from 7, and there resteth 3: the said 3 I set in the second place vnder the line next after 1. Thirdly I substract 3 from 8, & there resteth 5, the which 5 I put vnder the line in the third place next after 3. Finally I doe substract 2, from 9, and there resteth 7: the which 7 I put vnder the line in the fourth & last place next after 5, and thus is this substraction ended, and there remaineth 7531.

9876	
2345	
7531	

But when two figures of one likenes do chance to méet, so that the one must bee substracted from the other, as if I should substract 7 from 7 there would remaine nothing: then must I set a Cipher 0, vnder the line. But

when the figure which is to bee ſub-
ſtracted doth exceéd ỳ figure which is
ouer him, ſo that it cannot bee taken
out of the ſame figure. Thẽ muſt you
ſubſtract the vndermoſt figure from
10. and that which doth remaine, you
ſhall adde vnto the ſame figure which
is vppermoſt. And the ſumme which
reſulteth of them both, you ſhall ſet
vnder the line. But whenſoeuer you
doe borrow any ſuch 10 of the ouer-
number, you muſt adde 1 to the nert
nethermoſt figure following which
is yet to be ſubſtracted. And there is
nothing elſe to be done in ſubſtractiõ.
Example, I will Subſtract 93576.
from 4037479: after ỳ I haue pla-
ced my two numbers
as I ought to do, I doe
firſt ſubſtract 6. from

4037479.
93576.

3943903.

9, & there reſteth 3 then
I put the 3, vnder the
line right vnder the 6. And ſecondly,
I ſubſtract 7 from 7, & there reſteth
nothing: I do therfore put a cipher 0
vnder the line right againſt 7 in the
ſecond

ſecond place. Then I come to the third place where I find 5 which I cannot ſubſtract from the figure ouer him, which is but 4, therefore I doe ſubſtract it frō 10as before I taught: and there reſteth 5, the which I doe adde with the 4, which is ouer him, and ỹ maketh 9 : I put 9 in ſhe third place vnder the line for the third figure. Fourthly, for the 10 which I borrowed I adde one vnto the nert figure which is to bée Substracted, which is 3, and they make 4 : the ſayd 4 I doe ſubſtract from the ouer figure 7, and there reſteth 3, I put 3 vnder the line for the fourth figure. And then I come to ỹ fift place where I do find 9, which I cannot ſubſtract frō the figure ouer him, which is but 3, but I doe ſubſtract 9 from 10, and there reſteth 1, the which figure 1 I doe adde with 3, and they make 4 : I put 4 vnder the line for the fift figure And here is to be noted that if it were not for that I did at ỹ laſt borrow 10 the ſubſtraction ſhould haue béen en-

ded. But for because that I muſt (for euery ſuch 10 that I borrow) alwais adde 1 vnto the nexte lower figure following, I muſt therefore proceéd vnto the ſubſtraction. And for because that there is no other figure following in the lower number, it ſhall ſuffice to haue kept the vnity, & to ſubſtract it from the nexte ouer figure, but I find there 0, and therefore I cannot ſubſtract 1 from 0, therefore I ſubſtract it from 10, and there reſteth 9: which I doe put vnder the line in the firſt place: finally for the ten which I borrowed, I kéepe 1 in mind: The which I doe abate from 4, and there remaineth 3, the which 3 I doe put vnder the line in ỹ ſeuenth place after 9, and the operation is thus ended.

Another example.

5760840 26
48567543 7

90408589

But if there were many numbers to be ſuſtracted from one number alone, then muſt you firſt adde thoſe num-

numbers together according to the instruction of the Chapter going before, & afterward to make your substraction as aboue is sayd. As if I would substract these three summes 123, 234, 456, from 98925: first I do adde the three summes into one, & they are 813. The which I doe substract from 98925, and there resteth 98112.

But if the summes be composed of diuers kinds of denominations, then you must begin at the least denomination next toward your right hand, and so substract euery denomination from his like if it may be substracted, if it cannot be substracted, then you must borrow 1 of ỹ next denomination toward your left hand & reduce the same into the like denomination of that figure which is to be substracted, then shall you substract your first or least denomination, frō the said sum so borrowed, and that figure or number that shall remaine, you must adde with the vppermost number of the least

least denomination, and set the aggregate vnder the line right against his like. Then the 1 which you did borrow must bee added with the next figure of the next denomination that is to be substracted, and so to procéd with the whole summe that is to bée substracted. Example.

I would substract 15 li. 17 s̄. 11 d. from 28 li. 13 s̄. 6 d. I doe first put dowm the greater sum, & vnder that the lesser with a line vnder them, as héere you sée, li. s. d. and then I doe begin at 28.13.9. the least denomination 15.17.11.

which are penies, where 12.15.10.
I say 11. penies from 9. pennies, I cannot. And therefore I do borrow 1 s̄. of the next denomination that is of the 13 s. the which 1 s̄. is 12 penies: Then I substract 11 penies from 12 penies, and there remaineth 1 peny, the which 1 peny I doe adde with 9 penies, and they make 10. penies: the sayd 10 I set vnder the line & do kéepe the 1 s. in my mind that I borrowed,

borrowed, then come I to the second denomination of shillings, where I doe find 17 s. then I say 1 s. that I borrowed and 17 do make 18 s: the said 18 s. out of 13 s. cannot be, therfore I borrow 1 li. of the nert denomination, that is to say, out of the 28 li. and the said 1 li. are 20 s̄. then I substract 18 s̄. from 20 s̄. and there remaineth 2 s. with the which I doe adde the 13 s. and they doe make 15. the same 15 s. I set vnder the line and I do kæpe 1 li. to be added to the lower place of pounds: then I say 1 li. that I kæpe, and 5 are 6: I substract 6 li. from 8 li. & there remains 2. I set the sayd 2 vnder the line against 5: and last of all, I come to the tens of Pounds where I do find one, then I do sustract that 1 from 2, and there remaineth 1, which I set vnder the line, & so I find there remaineth 12 li. 15 s. 10 d. and so is to be done of all other like.

Chap. 4
Of Multiplication.

IN Multiplication there are .ij. numbers to bée noted, that is to say, the number which is to be multiplied, ỹ which we wil call the Multiplicand: the second is the number by the which we ds multiply which we will name ỹ multiplier, or Multiplicator: and the third number is ỹ which commeth of the Multiplication of the one by the other, which is called ỹ Product. As when I wold know how much amounteth 10 multiplied by 9, that is to say, how much are ten times nyne, I find that they are worth 90, then 10 is ỹ multiplycand, & 9 is the multiplier, and 90 is called the product. So ỹ to multiply, is none other thing, but to find a nũber which containeth the multiplicãd so many times, as the multiplyer containeth vnities: As 10 multiplied by

9 doe

9 do make 90 as before is said. And 90 containeth 10 so many times, as 9 containeth vnities, that is to say, 9 times. In Multiplicatiõ, it forceth not much which of the two numbers bée ỹ multiplycand, nor which be the multiplyer. For 10 multiplyed by 9, maketh as many, as 9 multiplyed by 10, yet neuertheless it shall be more commodious that the lesser number be alwaies the multiplyer.

And for that, that the multiplication of figures the one by ỹ other, is ỹ chiefe & necessariest kind whereby to know how to worke in the multiplycation of compoũd numbers, and that euery man hath not the same at their fingers end, I will therefore giue you héer certaine easie waies of multiplication of diget numbers. When you would multiply two simple figures, or digets ỹ one by the other, substract each of those diget numbers from 10. Then multiply the two remains the one by the other, and if the summe do excéd 10, write onely the first figure,

and

and kéepe the other to be added to the next operation, which is thus as followeth. Adde your 2 ſimple figures together, & of ỹ which reſulteth of the addition, take only the 1 figure, vnto the which you muſt ad ỹ vnity which you did kéepe beforе. And that ſhalbe the ſecond figure of ỹ ſum which you do ſéeke, Exam: I would multiply 7, by 6, I take 7 from 10 & there reſteth 3: likewiſe I ſubſtract 6 from 10 and there reſteth 4. then I ſay thus 3 times 4 make 12: I wrіte 2 for my firſt figure, and kéepe 1 in mind: then I ad 6 with 7, and they are 13: of the which I caſt away the ſecond figure toward my left hand which is 1: and I take onely the firſt figure 3 which is toward my right hand, vnto the which I ad the vnity which I kept, & they make 4, which I wrіte in the ſecond place after 2, & thus I find 42 which is the valure of 7 multiplied by 6.

Otherwiſe, and al commeth to one effect: ſet downe your two diget numbers the one right ouer the other, and

right

right against euery of them towards the right hand write his owne difference from 10. Then multiply ye two differences together, the figure which commeth thereof, shall you set downe vnder both the differẽces if it be a diget number, that is to say, any number vnder 10. But if there be 2 figurs set downe but the first, and kéepe the other in your mind, afterwards substract (frõ one of the two diget numbers) that were first set downe, ye diffence of the other diget number, that is to say, crosse-wise. And vnto the remaine add the figure which you kept before: & that shal be the second number, & thus shall you haue your multiplicatiõ. Example of the same figures



that is to say, of 7 multiplied by 6, the difference of 7 from 10. is 3: and the difference of 6 from 10, is 4: I set them downe crosswaies as you sée: And then I say thrée times foure ars 12. I set downe

dowme 2, and kéepe 1 in my mind, then I ſubſtract 4 from 7, or elſe thréé from 6, it forceth not, from which of them; & there reſteth alwaies 3: vnto the which I adde the vnity which I kept in my mind, and they are 4, which ſhall be the ſecond figure of the multiplication. And thus I find that 7, multiplyed by 6, maketh 42: as in the other operation. This practiſe hath no place where the 2 diget nvmbers (doe not exceed 10,) by adding them together, and then is multiplycation eaſy inough without any rule.

Another way to know the multiplication of ſimple numbers, is by this table following: the vſe whereof is thus.

Firſt you ſhall vnderſtand that the numbers from 1, and ſo deſcending downe-wards to 9, which are ſet in the left part or hanging margine of this table, doe betoken the multiplyers of all ſimple numbers. And the elements or figures being put higheſt in euery ſquare rowme drawing to-

ward

toward your right hãd, right against euery of the multipliers, doe signifie the multiplicands, which doe appertaine vnto the multipliers of ỹ hanging margine. And the lower or inferiour numbers in euery square rowne, doe betoken the product of that Multiplication, which is made in multiplying the vpper number ouer it, with the figure in the hanging margine, answering directly vnto the sayd square: as by example.

* *
*

D The

The Table of Multiplication by all the Diget Numbers.

1	1	2	3	4	5	6	7	8	9
	1	2	3	4	5	6	7	8	9
2	2	3	4	5	6	7	8	9	
	4	6	8	10	12	14	16	18	
3	3	4	5	6	7	8	9		
	9	12	15	18	21	24	27		
4	4	5	6	7	8	9			
	16	20	24	28	32	36			
5	5	6	7	8	9				
	25	30	35	40	45				
6	6	7	8	9					
	36	42	48	54					
7	7	8	9						
	49	56	63						
8	8	9							
	64	72							
9	9								
	81								

Firſt becauſe 1 doth not multiply, I haue ſet in the vpper margin the figures from 1, to 9: both in the higher and alſo in the inferior rowes, for 1, in the hanging margin, multipliad by 1, the vpper number in the firſt ſquare bringeth but 1. So likewiſe 2 being the higher number in ỹ ſecond ſquare of the vpper margine, multiplyed by 1 in ỹ hanging margin, bringeth 2 for the lower number in ỹ ſecond ſquare of the vpper margine: For 1 times 1 maketh but 1: and 1 times 2 maketh 2. Then 1 times 3 maketh 3: and 1 times 4 maketh 4: And ſo continuing toward the right hand, vntill I come to ỹ figure of 9 which is 1 times 9 maketh 9. Then afterwards I multiply 2 of the hanging margine by 2, which is the vpper number of the ſquare next toward the right haud, & that maketh 4 which is the product of 2 multiplied by 2, that 4 I ſet vnder ỹ 2, for 2 times 2 are 4: and 2 times 3 maketh 6: then 2 times 4 maketh 8 and 2 times 5 maketh 10, and ſo

continuing vnto 2 times 9, which maketh 18. The like is to bée done with the third row, and so likewise of all the residue.

Example, I would know what is the product of 9, multiplyed by 8. I séek in the hanging margine the multiplier 8, and amongst the squares directly against 8, drawing toward the right hand, I séeke the multiplicand 9, in the higher row, and I find the product right vnder 9, to be 72: Then 72, is the number which commeth of the multiplication of 9 by 8. And so is to be vnderstanded of all the rest of the table. Which table must be (of all men) learned by heart, or as they say, without booke: which being learned you shall the better attaine to the rest of multiplycation.

To come now vnto the practise of multiplication; when you wold multiply tws numbers, the one by the other, you must set them down after ỹ same manner as you did in Addition, and in subtraction: that is to say, the

first

first figure of the multiplier vnder the first figure of the multiplycand, the second vnder the second, and the third vnder the third, if there be so many, & then drawe a right line vnder them, as in the other operations going before. After this, you shall multiply all the figures of the multiplicand by the multiplier, and set downe the figures (comming of any such multiplication) vnder the line, euery one in their due order and place.

Examp. I would multiply 123 by 3, that is to say, I would know how much amounteth 3 times one Hundreth twenty and three, the two numbers being placed in such order as is before sayd, you must begin towards the right hand: and say thus,

123	3 times 3 are 9: write downe
3	9 vnder the line right against
369	3, for the first figure: secondly

by the same 3, you must multiply the second figure 2, and they doe make 6, I put downe 6 after the 9, vnder the line: Thirdly by the same

3, you shall multiply the last figure 1, and they are but 3, set downe 3 after 6 for the third and last figure. And thus is the worke ended: wherby you shall find, that 123 being multiplyed by 3 maketh 369.

But when it happeneth that of the multiplication of one figure by another, the sum which commeth thereof shall be of two figures, as it hapneth often, then shall you write downe the first figure, and keepe the other figure to bee added vnto the multiplication of the next figure.

Example, 6 men haue gained (euery one of them) 345 Crownes, I would know how many Crownes they had in all. First I multiply 6 by 5, they make 30. I write 0 vnder the line and for 30 I do keepe 3 to be added to the next multiplication. Secondly, I say 6 times 4, are 24: vnto the which I adde 3, which before I reserued: And they make 27. I write 7 in the secõd place vnder

345
6
2070

vnder the line, and I kéep 2, to be added to the next multiplication: Thirdly, I say 6 times 3, are 18, vnto the which I adde the 2 which I kéepe, and they make 20, the which I wzite all downe, foz because that is the last wozke. And so I find that 345, béeing multiplyed by 6, doe make 2070. But when the multiplyer is of many figures, you must multiply all the whole multiplicand by euery one of those figures, & wzite ỹ pzoducts euery one ozderly vnder his owne figure.

Example. I would know how many daies are past frõ the Natiuity of Iesus Chzist vntil the yéere 1560, ful compleat. I must now multiply 1560 by 365 daies, because there are so many daies in one whole yéer. The leap yéeres not béeing reckoned, which haue euery one of them 366 dayes.

Therefoze first by the figure 5: I multiply all the higher figures, saying thus, 5 time 0 maketh 0: I wzite 0 vnder the line foz

1560	
368	
7800	

the firſt figure, and becauſe I kéepe nothing for the next place, I proceéd and ſay, 5 times 6 are 30: I ſet 0 vnder the line for the ſecond figure, and I kéepe 3 to bę added to the next multiplication: Thirdly I ſay 5 times 5 are 25: The which with the 3 that I kéepe are 28: I ſet downe 8 for the third figuce, and kéepe 2 to bee added with the next multiplycation: Then comming vnto the fourth and laſt figure, I ſay 5 times 1 are 5: the which with ẏ 2 that I reſerued are 7: I put 7 for the laſt figure of this firſt worke by the figure 5, with the which figure I haue no more to do. And therefore I cancel the ſame ſ with a little ſtrike through it, to ſignify that I haue finiſhed with that figure. And foraſmuch that in multiplycatiõ ther is alwayes as many ſimple operations, as ẏ multiplyer contayneth figures, there reſteth yet 2 workes to be made. I come therefore to the ſecond worke which is ẏ figure 6, by the which I muſt again multiply all the figures of the multyplycand

plycand as I did by 5, and the firſt fi-
gure (which ſhall be produced) I doe
put one ranke more lower thā the fi-
gures of the worke now laſt made by
5, not right vnder the firſt figure of ỹ
multiplyer 5, but vnder 6: that is to
ſay one degrée or place nérer toward
the left hand: & one ranke more lower
than the firſt worke: and I muſt put
afterward euery of the other figures
which cõmeth of the ſame multiply-
cation in their order: thirdly I do make
the multiplycatiõ by the third figure,
& that which ſhall come therof I muſt
ſet in his ranke, as héerafter ſhall ap-
peare. And now I néed make no fur-
ther diſcourſe héerof, becauſe that hee
which can do the firſt multiplication
by 5, may as eaſily doe all the others.
It ſhall therefore ſuffice to ſet hereun-
der ỹ exãples of al the 3 ſũdry works

	1560	1560
1560	56	356
5	7800	7800
7800	9360	9360
	101400	4680
		569400

Now, if you will know how much all the three workings thus placed, doe amount vnto, which in value must be but one number: you must adde al the numbers which are come of all the 3 multiplications together, but not after the same maner as we haue done in the Chap. of Addition, the first figure of the first ranke with the first figure of the second rank, and so of the third: but you must adde them in the same sort as you shall find them scituated and placed: that is to say, the first figure of the first ranke alone by it selfe: the second of the first ranke with the first of the secõd rank. The third of the first ranke with the second figure of the second ranke, and with the first of the third rank: & so of al ỹ other as hereafter doth appeare.

And thus the 1560	1560
yeares doe contayne	365
Five Hundreth sixty &	7800
Nyne Thousand foure	9360
Hundreth dayes, not	4680
counting herein the	569400
	dayes

dayes of the leape yeares, which are hære in number 390, for then ỹ whole sum of the daies should be 569760.

Another Example

34560
2456

207360
172800
138240
69120

848793 60

The Summe of Multiplication is thus, when you would multiply any number by 10, you shall only put one cipher 0 before all the numbers, that is to say, a degrée néerer ỹ right hand as 345 multiplyed by 10, maketh 3450. If you wil multiply any nũber by 100, add to the same number two ciphers thus, 00, if by 1000, add 000. And to be briefe, when the last figure of the multiplyer is 1, and all the rest be ciphers, adde so many ciphers to your multiplicand, as there shall be found

found Ciphers in your multiplyer. But if in your multiplying, the laſt figure were not, but that there were onely certaine Ciphers in the beginning: and that the other were ſignifying figures, and likewiſe thoſe of the multiplycand, then ſhal you put thoſe Ciphers a-part, and multiply the ſignifying figurs of the one, by the ſignifying figures of the other. Then adde vnto the product of that multiplication, all the Ciphers which you did before put a-part. As if I would multiply 46000 by 3500. I put a-part the three ciphers of the firſt, and the two ciphers of the ſecond numbers, which are in all 5 ciphers 00000: And then I multiply 46 by 35, and therof commeth 1610: Before ỹ which toward the right hand, I adde the 00000 that I did put apart, and then the whole product will be 161000000.

$$\begin{array}{r} 46 \\ 35 \\ \hline 230 \\ 138 \\ \hline 161000000. \end{array}$$

Of

Chap. 5
Of Diuiſion.

DIuiſion or Partition is, to ſéeke how many times one nũber doth containe another, or elſe how often times one number may bée found in another, for in the worke of Diuiſion there are required two uũbers, to bée firſt knowne, for the finding out of the third. The firſt number knowen, is called the diuidend or number which is to diuided, and that muſt bée the greater number. The ſecond number is called the diuiſor, and that is the leſſer. And the third number which I doe ſéeke, is called the quotient. As if I would diuide 36 by 9, the diuidend ſhall bée 36, and the diuiſor is 9. And for becauſe that 9 is cõtained in 36, 4 times, that is to ſay, 4 times 9 doe make 36, the quotient ſhall be 4, as if you marke well, how many times 9 is con-

tained

tained 36, you ſhall find it 4 times: and therefore 4 ſhal be the quotient.

The practiſe.

Write downe firſt the diuidend in the higher number, and the diuiſor vnderneath in ſuch ſort, that the firſt figure of the diuiſor toward the left hand, bee vnder the firſt figure of the diuidend, & euery figure of the ſame diuiſor vnder his like, that is to ſay, ỹ firſt vnder the firſt, the ſecond vnder the ſecond, the third, vnder the third, and ſo conſequently of the other, if there be ſo many, which is contrary to the other three kindes before ſpecifyed: but yet you muſt cõſider further if all the lower figures of the diuiſor, may be taken out of ỹ higher figures of the diuidẽd by the order of ſubſtraction or not. The which if you cannot do, then muſt you ſet the firſt figure of the diuiſor (toward the left hand) vnder the ſecond figure of the diuidend, and ſo conſequently the reſt in their due order, if any bee to be ſet downe,

euery

euery one of them vuder his like, as before is ſayd. And then drawe a line betwéene the diuidend and the diuiſor. And at the end of them another crooked line, behind the which toward the right hand ſhal bee ſet your quotient. As by this example following, where the diuiſor is but of one figure.

If you would diuide 860 by 4, you muſt ſet downe 4 vnder the 8 with a line betwéen them, as here vnder you may ſée.

The Diuidend. 860

The Diuiſor. 4

And then you muſt ſéek how many times the diuiſor 4 is contayned in ỹ hygher nũber, that is to ſay, in 860, ỹ diuidend anſwering to him, as in this our example, I muſt ſéeke how many times 4 is cõtained in 8, in the which I find it 2 times, then I write down 2 apart behind the crooked line as here you may ſée, which ſhal be the firſt figure of the quotient to come, ſecondly by this figure 2 (béeing

thus

thus put apart) I must mul- 8 6 0
tiply the diuisor 4; and vn- 4 (2
der the same multiplication, 8
I must set that number which
cõmeth of the same multiplication, as
2 times 4 doe make 8, ỹ which 8 I doe
set vnder the diuisor 4. Thirdly, I do
substract the product of the said mul-
tiplication (of the quotient by the di-
uisor) that is to say, 8 from the higher
number correspondent to the same, in
saying 8 from 8, there remaineth no-
thing, and then I cancell or strike out
that which is don as yousée. In these
thrée operations and workes is com-
prehended the Art of Diuision. The
which are to bee obserued from point
to point, for there is no diuersity in ỹ
finishing of the same, which is thus.

Now secondly, I must remoue my
diuisor one place nérer toward my
right hand, as in procéeding
with our exemp. Hére you 2
sée I remoue my diuisor 4, 8 8 0 (2 1
which was vnder 8, and I 4
set it vnder 6, then I séeke how many
times

4 is contained in 6: where I find it but one time, then I ſet 1 behind the crooked line next vnto the firſt figure of the quotient 2, a degrée or place nérer my right hand, afterward by this laſt & new figure 1, I multiply ỹ diuiſor 4, & that maketh but 4 (for an vnity which is but 1, encreaſeth nothing) I abate therfore 4 from the higher figure 6, & there reſteth 2, the which 2 I ſet ouer the 6: and I cancel the 6, for ſo I muſt doe whē there reſteth any thing after I haue made the ſubſtraction. Thirdly, for as much as there yet remaineth another figure in the diuidend, I remoue again ỹ diuiſor & I ſet it vnder the cipher 0. Then I ſéeke how many times 4 is in the higher number, which is 20, where I may find it 5 times, I put therefore 5 behind the crooked line for the third and laſt figure of ỹ quotient. Then by the ſame 5, I multiply ỹ diuiſor 4 and that maketh 20, the which 20 I

```
      2
  8 6 0 (215
      4
    2 6
```

abate from the higher nũber, & there reſteth nothing. And ſo is this diuiſiõ ended: & thus I haue found that 860 being diuided by 4, bringeth for the quotient 215: that is to ſay, that 4 is contained in 860, two hundreth & fiftéene times. This is the moſt eaſieſt working that is in diuiſion, but that which followeth appertaineth to the whole and perfect vnderſtanding of the ſame. When the firſt figure of your diuiſor toward your left hand, is greater than the firſt of the diuidend, you muſt not place the firſt figure of your diuiſor right vnderneth the firſt of the diuidend, but vnder the ſecond figure of the ſame diuidend, nérer to your right hand, as before is ſayd. Therefore when the diuiſor is of many figures, and that you haue to ſéke how many times it is cõtained in the higher number, (for the more eaſier working) you muſt not ſéke to abate the diuiſor all at one time, but you muſt ſée & mark how many times the figure of the ſame toward the left hãd

is

is contayned in the higher number answering to the said numbe, and thē to worke after the same manner as is before taught.

Example, I haue 316215 crowns to be diuided among 45 men, and for to make my diuision, I must not put the first figure of the diuisor which is 4, vnder the first of the Diuidend, which is 3, because that 4 is a greater number than 3. And further, you know, that I cannot take 4 out of 3, wherefore I must set the 4 vnder the second figure of the higher number, that is to say, vnder 1, and the figure 5 of the diuisor, right vnder the 6, as héere you may sée.

So that I must first sèeke, how many times 45 45, is contayned in 316, which is but apart of the Diuidend. Wherefore for ỹ more easy working I néed but to sèeke how many times 4 is contained in 31. And because I may haue it 7 times, I put 7 behind the crooked line, as is aforesaid: then

316215
45

by 7, I multiply al the diuiſor 45 and they are 315: the which I ſet vnder ye ſame diuiſor the firſt figure vnder the firſt: and the other in order towards the left hand. Then I ſubſtract 315, from the higher number 316: and of this firſt working there remayneth but 1, the which I ſet ouer the 6, and I cancell likewiſe the 315, and the other figures 316, and alſo the diuiſor 45: and then it will ſtand thus as in the margent.

	1
316	215
45	(7
315	

And when I come to remoue the diuiſor, and that I muſt ſéeke how many times it is contayned in the higher number, if I ſée that I cannot find it there, that is to ſay, that if the higher number, be leſſer thã the diuiſor, as it is in this example, then muſt I put a cipher in the quotient behind the croked line, and if there remaine any figures in the diuidend which are not yet finiſhed: I muſt remoue the diuiſor again nérer toward my right

hand

hand by one place, for to find a new figure in the quotient. As in this our example, for after that I haue remoued the diuiſor, I ſéeke how many times 45, is contayned in 12, and becauſe I cannot haue 45 in 12, I put a 0 behind the croked line after 7: thē without multiplying or abating, I remoue againe the diuiſor néerer towards my right hand, and I ſéeke how many times 4 (which is the firſt figure of the diuiſor) is in the higher number, that is to say in 12, whereas I find it 3 times: I put 3, behinde the croked line, for the third figure of the quotient: then by the ſame figure 3, I multiply the diuiſor 45, and thereof commeth 135. And in the number ouer it there is but 121, ſo that I cannot take it out of 121, which is the leſſer number. And therefore héere is to be noted

```
   1
3 X 8 2 1 5
-----------
  45 (7 0
```

```
   1
3 X 8 2 1 5
-----------
  45 (7 0 3
    135
```

noted, that if it happē, that the figure being laſt found which is put in the quotient, doe produce or bring forth a greater nnmber (in multiplying all the diuiſor by the ſame) than ẏ which is ouer the ſaid diuiſor: you muſt then make the ſame figure of your quotiēt (which you doe put downe) leſſer by 1, and after that you haue cancelled the firſt multiplycation, you muſt make a new. And the ſame muſt bee done ſo oftentimes: as (in decreaſing the ſame) it may produce a leſſer number, or atthe leaſt a number equal to that which is ouer it, as in the laſt worke, for because that the diuiſor, being multiplied by 3, bringeth 135, which amounteth to more than 121. Therfore the ſame product muſt be cancelled, and the figure 3 which I did put in the quotient, muſt be alſo changed into a figure of 2. Then by the ſaid 2, I muſt multiply the diuiſor 45, and therof commeth 90, the which I abate from 121, and there remaineth 31. And then will the ſum

ſtand

ſtand thus as followeth.

```
  X 3
-------
3 1 6 2 1 5
    4 8     2
    X 3 8 (70 3
      9 6
```

And héere is alſo to be noted, that the ſumme which remaineth muſt bée alwaies leſſer then the diuiſor. Then finally, I remoue the diuiſor to the 2 nert figures towards the right hand, and I ſéeke how many times 4 is in 31, and for because I find it 7 times, I put 7 in the quotient, by the which I multiply the diuiſor, and thereof commeth 315, the which I abate from the higher number of the Diuidend, and there remaineth nothing as héere you may ſée.

```
    X 3
  3 X 6 2 X 8
-----------------
      4 8        (7027
    3 X 8
```

But if it happen that after the diui-

ſion is ended, there doe remaine any thing in the diuidend, as oftentimes there doth; I muſt alſo ſet them that remain apart behind the crooked line, after the entire quotient, and the diuiſor right vnder the ſame remaine, with a line betweén them both. As in this diuiſion following, where there remaineth 3 in the laſt worke. And what the ſame doth ſignifye ſhall bée taught vnto you when I ſhall treate of fractions or broken numbers.

i.

```
      11
   A87859
  ------------
   A56  (1
```

ij.

```
      11
   A87859   (10
  ------------
   A56
```

iij.

```
       2
    1173
  A87859
  ------
   A56
   912  (102
```

iiij.

```
       2
    1173
  A87859    3/456
  ------------
   A56   (1026
   273
```

In

In ſumme, all the whole practiſe of diuiſion may be kept in remembrãce by thrée letters, that is to ſay: S, M, and A, which thrée letters do ſignifie, to ſéeke, to multiply, and to abate.

Firſt, I muſt ſéek how many times the diuiſor is contayned in the higher number: then by the quotient (which I find) I muſt multiply the diuiſor: finally, I muſt abate the product of that multiplication, from the higher number correſpondent to the ſame, that is to ſay: out of the diuidend, anſwering to the diuiſor.

And further, beſides this kind of working in diuiſiõ: The which is regular and commune; I will héere put another maner of working very eaſy The which ſhall ſerue for ſuch diuiſions as are more difficil to be wrought. That is to wit, when ỹ number to be diuided is very great, and the diuiſor great alſo, and it ſhall ſerue again for to auoid errour in ſupputation, and for the placing of fewer figures in the quotient: & conſequently it ſhall ſaue

much

much labour vnto them which as yet haue not much ſtudied in this Art. The practiſe whereof is thus as followeth.

If you would diuide 7894658, by 643. Firſt you ſhall vndeſtand, that although the figure of the diuiſor toward your left hand, may bee found many times in the higher number, as 10 times, 12 times, or more: yet is it ſo, that you muſt neuer put but one figure onely at a time in your quotient. And you ſhall at no time put any number in your quotient which exceedeth the figure of 9, that is to ſay, any number beeing greater than 9. And therefore for to come vnto your practiſe, write downe your diuiſor one time, and behind it towards your right hãd, draw a line down ſtraight, and right againſt the ſame diuiſor behind the line toward the right hand, put this figure 1. Then double your ſaid diuiſor, and right againſt the ſame which you haue doubled, put behind the line the figure of 2. This

done

done, you ſhall ad vnto the ſame num-ber that you doubled your ſaid diui-ſor, & right againſt the ſame product behind the line you ſhal put the figure of 3. and vnto this third product you muſt adde againe your diuiſor, and right againſt the ſame product behind the line, ſet the figure 4. And thus muſt you doe vntill you come to the figure of 9, in ſuch ſort, that euery of the products doe ſurmount ſo much his former number, as all the diuiſor doth amount vnto : placing at the right ſide of euery product behind the line, the number which ſignifieth how much he is in order. That is to ſay, right againſt the fift product, you muſt put 5, and right againſt the 6 product, you muſt put 6 : and ſo likewiſe of all the other.

The Example followeth in the next page.

Example

Example of the diuiſor propoſed, 643: Firſt of all I write down 643 and right againſt the ſame behinde the line toward my right hand, I put 1: Secondly I double 643, and they make 1286: and right againſt that Sum behind the line I put 2. Thirdly vnto that ſame 1286, I ad the diuiſor 643, and they are 1929, and right againſt the ſame I ſet 3. Fourthly, vnto the ſaid 1929, I ad the diuiſor 643, and they make 2572: and right againſt the ſame, I put 4. And thus muſt you doe alwayes by encreaſing ſo much euery product, as the diuiſor doth amount vnto, vntill you haue ſo done nyne times, as you ſée in this preſent table.

643	1
1286	2
1929	3
2572	4
3215	5
3858	6
4501	7
5144	8
5787	9

This beeing done, you muſt ſet downe your diuiſor vnder the diuidēd 7894658,

7894658, after the ſame maner as is before declared: that is to ſay, 643, vnder the 3, firſt figures of the diuidend toward your right hand, namely vnder 789. Then muſt you ſéeke how many times 643, are contayned in 789: And for to know ỹ ſame, you muſt look in the aforeſaid table if you may there find the ſame number 789, the which is not there. Therefore you muſt take a leſſer number, the néereſt to it in quantity that you can find in the table, the which is 643, which number hath againſt it on the right hand of the line, this diget 1. Then take the ſayd 1, and put it behind the croked line, for the firſt figure of the quotient.

Then you muſt abate 643, from 789, and there will remaine 146, the ſame ſhall you put ouer the 789, and cancell the 789: and thus is the firſt worke ended. Then ſet forward the diuiſor one figure nérer to your right hand, and ſéeke a new quotiont as you ſought this, where you find the higher

higher number ouer your diuiſor to bée 1464. The which ſéeke in the Table, & for because you cannot find it there, you muſt take leſſer a nũber the nærest to it that you can find, and that is 1286: which number hath against it this diget 2. Therefore you muſt put 2, for the ſecond figure of the quotient behind the line, and then abate 1286, from the ſaid 1464, and there wil remaine 178. Thirdly, remoue forward the diuiſor as you did before, and you ſhall find the higher number ouer it to be 1786, ſo that the next leſſer number to it in your table, is againe 1286, put therefore once againe 2, in the quotient for the third figure: and abate the ſaid 1286, from 1786, ſo there will remaine 500.

Fourthly, ſet forward the diuiſor: & the higher number ouer it, is 5005, and the next leſſer nũber to it in your table, is 4501, right againſt ỹ which is 7, put 7 in the quotiẽt, for ỹ fourth figure. And after that you haue abated 4501, from 5005: there will remaine

maine 504. Finally remoue forward your diuisor vnto the last place, and you shall find the higher number ouer it to be 5048. And the next lesser numbet to it in your table, is 4501. Therfore set 7 again in the quotient for the fift and last figure. Then substract 4501. from 5048, and there wil remaine 547 : which must bée put at the end of the whole quotient, w̄ the diuisor vnder it, and a line betwéene them, in this manner followin.g

(12277 $\frac{547}{643}$

The Summe of Diuision.

WHen you would diuide any number by 10, you must take away the last figure next towards your right hand, and the rest shall bée the quotient. Example : As if you would diuide 46845, by 10: take away the 5, and then 4684 shal be the quotient, & the 5 shall be the number that doth remaine. Likewise when you would diuide any number by

100,

100, take away the two last figures towards your right hand, and if you would diuide by 1000; take away three figures, if by 10000, take away foure figures. And so of all other, whē the first figures of the diuisor toward the left hand shall be onely 1, and the rest of the same diuisor being but Ciphers.

Heere follow the proofes of Addition, Substraction, *Multiplication*, and *Diuision*.

The proofe of Addition.

When you would proue whether your Additiō be well made, consider the figures of the numbers which bee added, euery one in his simple value, not hauing any regard to the place where he standeth, but to reckō him as though he were alone by himselfe,

selfe, and then reckon them all, one after another, casting away frō them the number of 9, as oft as you may. And after your discourse made, kéepe in mind the same figure, which remaineth after the Nynes bée taken away: or else set the same in a voyde place at the vpper end of a line. For if your addition bee well made, the like figure will remaine, after that you haue taken away all ỹ nynes out of the totall summe of the same Addition, as oftentimes,

as you may there find	24567	2
any: as in this Ad-	5329	
dition which héere	481	
you sée, there re-	30377	2

maineth 2, for each part.

The proofe of Substraction.

ADde the number which you doe substract, vnto the nūber which remayneth after the Substraction is made, and if the totall summe of that addition bee like vnto the number,

from the which the substraction was made, you haue done well, otherwise not : as in this example doth appeare where you see the nunber which is to be substracted from 5463, is 3584, & the number which doth remaine is 1879 the which 2 sums being added together do make 5463, which is like to the higher number, out of the which the substraction was made, as before is said.

5463	
3584	
1879	
5463	

The proofe of Multiplicaion.

THe proofe of Multiplication, is made by the help of diuision. For if you diuide the number produced of the multiplication, by the multiplyer, you shall find the higher number which is the multiplycand.

The proofe of Diuision.

TO know if your diuision be well made, you must multiply all the quotient by your diuisor, and if any thing do remaine after your diuision is made, the same you shall adde vn-

to the ꝓduct which commeth of the multiplication, and you ſhall find the like nũber vnto your diuidend, if you haue well diuided: otherwiſe not.

Chap. 6
Of Progreſſion.

Progreſſion Arithmatical, is a ꝺꝛæef and ſpæedy aſſembling oꝛ adding together of diuers figures oꝛ nũbers, euery one ſurmounting the other cõtinually by equall difference, as 1, 2, 3, 4, 5, &c. Hære the difference, from the firſt to the ſecond, is but of 1, and ſo doe all the other, euery one excæd his foꝛmer figure by 1 ſtil to the end. Likewiſe 2, 4, 6, 8, &c. doe ꝓcæd by the difference of 2. Alſo 3, 6, 9, 12, &c. doe euery one differ from other by 3. And ſo may theſe numbers continue, infinitely after this oꝛder, in adding vnto the 3 number, ẏ quantity wherein the 2 doth differ from the 1: Likewiſe adding the ſame difference vnto the 4 nũber, alſo to the 5, and ſo vnto all the other: as 1, 4, the difference of the ſecond to the firſt is thꝛæe, adde

Progreſsiõ Arithmeticall.

3 vnto 4, and they are 7 for the third number. Then ad 3 vnto 7, and they make 10 for the fourth number, and ſo of all other.

Then if you will adde quickly the number of any progreſsion, you ſhall doe thus, firſt tell how many nũbers there are, and write their ſum downe by it ſelfe, as in this exãple, 2, 5, 8, 11 & 14, where the number of their pla-
5. ces are 5 as you may ſée, therfore you muſt ſet downe 5 in a place alone as I haue done héer in the margent. Thẽ ſhall you adde the firſt number & the laſt together, which in this example are 14 and 2, and they make 16, take halfe therof which is 8, and multiply it by the 5 which I noted in the margent, for the number of ỹ places. And the ſumme which amounteth of that multiplication, is the iuſt Summe of all thoſe figures added together. As in this example: 8 multiplyed by 5 do make 40: And that is the totall Sum of al the figures. Another example of parcels ỹ are euen, as thus 1, 2, 3, 4, 5

and

and 6. So that in this example you muſt likewiſe note downe the number of the places, as before is taught, and then ad together the laſt number and the firſt. And the Summe which commeth of that Addition, ſhall you multiply by halfe the number of the plaees which before are noted, and that which reſulteth of the ſame multiplication, is the whole ſumme of all thoſe figures, as in this former example, where the number of the places is 6, I note the 6 apart, and then I adde 6 and 1 together: which are the laſt and firſt numbers, and they make 7, the which I multiply, by 3 which is halfe the number of places, & they make 21. and to ſo much amounteth all thoſe figures added together.

Queſtions done by Progreſſion Arithmeticall.

1 A Marchant hath ſold 100. kerſies after this manner following, that is to ſay, the firſt peece for

1 s. the ſecond péece for 2 s̄. the third for 3 s̄. and ſo forth riſing 1 s̄. in euery péece of Kerſey vnto the hundreth péce. The queſtion is to know, how much he ſhall receiue for the ſaid 100 péces of Kerſeis? Anſw. It behoueth you to know the addition of the 100 termes in this progreſſion: And therefore you muſt adde 1 s. which is the price of the firſt péce with 100 s. which is the price of the laſt péce, & thereof commeth 101. the ſame 101 you muſt multiply by halfe the number of places, that is to ſay, by 50, and thereof commeth 5050 s̄. which being diuided by 20 s̄. therof will come 252 li. 10 s. 0 d. which is 2 li. 10 s̄. 6 d. a péece, one with another. Thus the 100 Kerſeis are ſould by the ſaid Marchant for 252 li. 10 s. 0 d. The practiſe followeth.

100
1

101
50

5050

1 1
5050 (252 li. 10 s.
2220

Queſtious

Queſtions of Progreſſion.

2 I would lay 100 ſtones or other things in a right line, and every of the ſaid ſtones to be a iuſt pace one from another: & one pace off from the firſt ſtone, there ſtandeth a basket. I demaund how many paces a man ſhall goe in gathering vppe the ſaid ſtones, and bearing them vnto the basket, ỹ 1 ſtone after the other? Anſ. Firſt when he fetcheth the firſt ſtone and putteth it into the basket, hée maketh 2 paces, for the ſecond 4 paces, for the third 6 paces, for the 4. 8: & ſo forth vnto the laſt ſtone: wherfore the laſt terme ſhall be 200, vnto the which you muſt adde the 1 terme, which is 2, & they make 202, whereof the halfe is 101, the which you ſhal multiply by 100, which is the number of the termes in your progreſſion or elſe multiply 202 by 50, which is halfe the number of paces, and therof will come 10100 paces, and ſo many paces ſhall he go in all

Queſtions of Progreſſion Arithmeticall.

3 THere is a meſſenger which goeth euery day 8 miles: another man followeth him incontinently, & he goeth the firſt day 1 mile, the ſecõd day 2 miles, the third day, 3 myles, and ſo encreaſing his iourney, euery day one mile by naturall progreſſion. The queſtion is to know in how many daies the ſecond man ſhall haue ouertaken the firſt. Anſwere. You muſt conſider that 8 is the middle or halfe as well of the termes, as of the number of the daies: And therefore double 8 & therof cõmeth 16: ſubſtract 1, and there will remaine 15: and in ſo many daies ſhal he haue ouertaken the firſt menger. The proofe thereof is very ealy. If the ſecond had gone the firſt day 2 miles, the ſecond day 4 myles, the third day 6 myles, and ſo encreaſing euery day his iourney, by 2, in how many daies ſhold he haue ouertaken the firſt man, for to do this

you

you muſt perceiue that 8 is the middle and fourth terme. Therefore double 4 and they make 8, from the which ſubſtract 1, and there remayneth 7, and ſo in many daies he ſhold haue ouertaken him.

Queſtions of Progreſſion Arithmeticall.

4 THere is one man departeth from London to Cheſter, and ſo to Carnaruan, the diſtance bæing about 200 myles: hee goeth the firſt day 1 myle, the ſecond day 2 myles & third day 3: and ſo orderly by natural Progreſſion. Another man departeth at the ſame inſtant from Carnaruan to London, and goeth the firſt day 2 myles: the ſecond day, 4 myles: the third day 6 myles: and ſo encreaſing euery day 2 myles. The Queſtion is, to know, in how many daies they two perſons ſhall mæte together. Anſwere. Firſt, you muſt conſider, that hæ which goeth by Progreſſion natu-

naturall, maketh but halfe the way ꝙ the other doth, so that hée shall haue made but the one 3 part of the way, at their méeting together. Take therfore the $\frac{1}{3}$ part of 200, and you shall haue $66\frac{2}{3}$. Then must you séek 2 numbers, wherof the greater of thē, may be double vnto ꝯ other, lesse 1: & that ꝯ 1 of thē béeing multiplyed by the other, the product of thē may bee $66\frac{2}{3}$, or little more, so that the more do not exceéde the value of the greater terme as héere in this question the 2 néerest numbers are 12, and $6\frac{1}{12}$, which multiplied the one by the other, doe make 78, which is $11\frac{1}{3}$ more then is $66\frac{2}{3}$, wherefore that day when they should méete together, the first had gone but $\frac{2}{3}$ of a mile of his iourney, which was vppon the 12 day: then if you will know what part of the day that they did méete, you must diuide $\frac{2}{3}$ by 12, and you shall find $\frac{1}{18}$ of a day. Therefore in 11 daies and $\frac{1}{18}$ part of a day, that is vpon ꝯ twelfth day, they shall méete together.

5 IF a man doe owe vnto me 1000 crownes, to bee paid in 20 daies or termes, by Arithmeticall progression: The question is, to know with what number he shall begin and continue his progression: Ans. To do this you must ad 1 vnto 20, and they make 21, the which you shall multiply by 10, which is halfe the number of the places, and thereof commeth 210, & therefore diuide 1000, by 210, and thereof wil come $4\frac{16}{21}$, the paiment of the first day, and by this number doth the said Progression encrease in this sort following: $4\frac{16}{21}$, $9\frac{11}{21}$, $14\frac{16}{21}$, $19\frac{11}{21}$ &c. And so of all others,

A man oweth me 400 li. to be paid in 10 yéeres by progression Arithmeticall, ý is to say, 40 li. at the end of the first yeare, and euery yeare following 40 li. to the end of 10. yeares: he offereth to pay me the sayd 400 li. all at one payment. The questiõ is to know, at what time he ought to pay me the same at one payment, that I be not interessed in the time? Answ:

adde

adde 1 vnto the number of the terms which are 10, & they make 11, wherof you muſt take the halfe, that is to ſay, 5 $\frac{1}{2}$: Therefore he muſt pay me at 5 yeare and $\frac{1}{2}$ the ſaid 400 li. all at one time: for that which he paieth before, is equal to ỹ which remaineth vnpaied. This rule hath place only when ỹ paiments are equal. But if it happen, that the laſt paiment be leſſer than ỹ others you muſt in this caſe, put ỹ laſt paiment ouer one of the others, for to make therof a fraction: ỹ which muſt bee added vnto the number of the termes, and the halfe of the ſaid ſum being taken, I ſhall ſhew the time ỹ the ſaid paimẽt ought to bee paid at once. As if ỹ ſaid party did owe me but 380 pounds, to be paid euery yére 40 li. it is certain ỹ he muſt haue 10. yéres to end the paimẽts. And it is true that vpon the 10 day there wold remaine but 20 li. to be paid. And therfore put 20 ouer 40 in this ſort, $\frac{20}{40}$ & that maketh $\frac{1}{2}$, the which you ſhal ad vnto the number of termes, and you ſhall haue

10 $\frac{1}{2}$,

10 ½, whereof the halfe which is 5 ¼, doth ſhew that hée muſt pay the ſayd 380 li. at 5 yeares ¼, all at one payment, and ſo of all ſuch like.

Progreſſion Geometricall is whē the ſecond number containeth the firſt in any proportion: as 2, 3, or 4, times, and ſo forth. And in like proportion ſhal the third number containe the ſecond, and the fourth number containe the third, and the fift, the fourth, &c. As 2, 4, 8, 16, 32, 64: héere the proportion is double. *Progreſſion Geometrical.*

Likewiſe, 3, 9, 27, 81, and 243: are in triple proportion.

And 2, 8, 32, 128, and 512, are in proportion quadruple.

That is to ſay, in the firſt example, where the proportion is double, euery nūber containeth ỹ other 2 times, as 4 contayneth 2, two times: 8 containeth 4, two times, &c. In the ſecōd example of triple proportion, the nūbers exceéd each other thrée times. And in the third exāple, the numbers exceéd each other foure times, & thus

you

you sée that Progression Arithmetical differeth from progression Geometricall, for that in Progression Arithmeticall the excesse is onely in quantity, but in progression Geometricall, the excesse is in proportion.

Now if you wil easily find ẏ Sum of any such nũbers, you shall do thus, consider by what nũber they be multiplied, whether they bée multiplied by 2, 3, 4, 5, or by any other: and by the same number, you must multiply the last sum in the Progression. And from the product of the same multiplication, you shall abate the 1 number of that progressiõ: and that which remaineth of the said multiplication, you shal diuide by 1 lesse then was ẏ nũber by ẏ which you did multiply, & ẏ quotient shal shew you the sum of al ẏ numbers in any progression. As in this examp. 5, 15, 45, 135, and 405: which are in triple proportion. Now multiply 405, which is the last number, by 3: because they are in triple proportion, and they are 1215, from

the

the which you ſhal abate the 1 nũber of the progreſſion, which is 5 & there remaineth 1210: the which you ſhall diuide by a number leſſe by 1 then ẏ was by the which you did multiply, that is to ſay by 2: & you ſhal find in ẏ quotient 605: which is the totol ſum of the numbers of that Progreſſion. Likewiſe 4, 16, 64, 256. and 1024, which are in proportion quadruple: therefore you ſhall multiply 1024, by 4, and thereof will come 4096, from the which abate the firſt number 4, and there will remaine 4092: The which you muſt diuide by 3, and you ſhall find in your quotient 1364: which is the totall ſumme of that progreſſion, and this ſhall bée ſufficient for Progreſſion.

A Queſtion of progreſſion Geometricall.

A Marchant hath ſold 15. yardes of Satten, the firſt yard for 1 s̄. the ſecond 2 s. the third 4 s. the fourth 8 s. and ſo encreaſing by double progreſſion Geometricall. The queſtion

is

is to know how much the said Marchant shall receiue for ỹ said 15 yards of Satten? Answ: First it is nedfull to know, how much the whole numbers of the said progression do amoũt vnto together. And for to do it, you must find the last terme, therfore you must set downe the said Progression vnto the 8 terme, which is 128: the which you shall multiply by it selfe, and thereof commeth the Fiftenth terme, that is to say, 16384: the same shall you multiply by 2, for because ỹ Progression is double. And thereof wil come 32768 from the which you must substract the first terme which is 1. And the rest being 32767, is the iust Summe of the 15 termes: and consequently the 15 yards of Satten shalbe worth 32767 shillings, the which are 1638 li. 7 s.

The

Chap. 7.
Of the rule of Three, called the *Golden rule: or the rule of foure Proportionals.*

THe rule of Three, is the chiefest, most profitable, & the most excellent Rule of all the rules of Arithmeticke. For all other rules haue need of it, and it passeth all other, for the which cause it is said, that the Philosophers did name it the Golden rule. And after others opinion and iudgement it is called the rule of proportiõ of 4 numbers. But now in these latter dayes, by vs it is called the rule of Three, because it requireth three nũbers in his operation. Of the which three nũbers, ỹ 2 first are set in a certain proportion, & in such proportion as they be established, this rule serueth to find out vnto ỹ 3 number, the 4 nũber to him proportioned, in such sort as the 2 is proportioned vnto the first. Not for that, that the foure numbers, nor yet the three, are to be pro-

 porti-

portionall, or set in one proportion, but such proportion, as is from the first to the second, ought to bee from the third vnto the fourth, that is to say, if the 2 number doe containe the 1 two times or more, so many times shall the fourth number containe the third. And note wel that the firſt number & the third, in euery rule of three ought and must be alwaies of like denomination, and of one conditiõ and nature. And the second number, and the 4, must likewise bee of one semblance and likenesse, and are dissemblant, and contrary to the other two numbers: that is to say, to the first, & the third. And if you do multiply the first number by the fourth, and the second number by the 3, the products of your two multiplications will bee equall. Likewise if you diuide the one semblant by the other, that is to say, the third number by the first, & likewise the one dissemblãt, by the other; that is to say, the 4 number by the second (which are dissemblant to the

other

other two numbers) your two quotients will also be equall.

The stile and manner of this rule, is thus: you must set down your three numbers in a certain order, as by example following shall appeare. And then you shal multiply the third number by the second, and the product or number that cõmeth of the same multiplication, you must diuide by ỹ first number: or otherwise, diuide the first number by the second, & the quotient thereof shall be your diuisor vnto the third number, that is to say, the third number shalbe diuided by the quotiẽt of the foresaid diuision, that is by the quotient of the first nũber diuided by the second. Or otherwise, diuide the second number by the 1, and that nũber which cõmeth into your quotient you shall multiply by the third number. And thus shall you haue ỹ fourth nũber which you séeke for. And thus is your fourth nũber in such proportion vnto the third, as your second number is vnto the first. *Rules*

Example.

If 8 be worth 12, what are 14, worth, after the rate: or else if 8 require 12 for his proportionall, what will 14 demaund: The which three numbers may conueniently be set in such order, as hereafter doth appeare.

If 8 make 12, what will 14 make: you must multiply the third number 14, by the second which is 12, and thereof commeth 168 for the whole product of this multiplication: the which (as the rule teacheth) you must diuide by the first number, that is to say by 8, & thereof commeth 21. And so much are the 14, worth. This is the way which is most vsed.

8.. 12.. 14..

14
12
28
14
168

168 | 21.
88 |

Other-

Otherwise diuide 8 by 12, which you cannot doe, for they are $\frac{8}{12}$, wherefore abbreuiate $\frac{8}{12}$, and they are $\frac{2}{3}$ for your quotient, then diuide the third number 14, by the said $\frac{2}{3}$, multiplying 14 by 3, which maketh 42: diuide 42 by 2, and you shall haue 21, as before. Or else diuide the second number 12 by the first number 8, and therof cõmeth $1\frac{1}{2}$, the which $1\frac{1}{2}$ you shall multiply by the third number 14, and thereof will come 21, as is aboue said; and thus must you doe of all other: and although, that the numbers of this rule may be found in three differences, for sometimes they are whole numbers and broken together, sometimes broken number, and broken together, & sometimes all whole numbers: if they be whole numbers, you must doe none otherwise, then you did in the last example. But in case they be broken numbers, or broken and whole numbers together, the maner and way to

2
4
8
12
6
3

doe them, requireth a certaine variation and difficulty, according to the variety of the numbers that shall bee proposed; the which operation easily to doe, and vnuariable, this rule teacheth.

The three numbers being set down according vnto the order of the whole numbers aforesaid, without any broken number, let 1 be put alwaies vnderneath euery whole number, with a line betweén them fraction-wise, as thus $\frac{8}{1}$, and that 1 is denominator to euery such whole nnmber. But when you haue whole number and broken together, they must be reduced & added with their broken number, and if there be broken number without any whole number, the same broken must remaine in their estate.

The rule of Three in Fractions.

This being done, you shall multiply the denominator of the first number, by the numerator of the second, and mul-

multiply the product therof again by the numerator of the third number. And so shall you haue the diuidend or number which must be diuided, then multiply the numerator of the first number, by the denominator af the second, and multiply again the product therof, by ỹ denominator of the third number, and that which commeth of this multiplication, shalbe your diuisor. Then diuide the number which is to be diuided by ỹ diuisor, and you shall find the fourth number that you séke. Of the which maner and fashions, of the rule of 3, are diuers kinds whereof the first is of 3 whole numbers, as was the last example, & héere followeth the second.

If 15 pounds do buy me 2 clothes, how many clothes will 300 pounds buy mée of the same price, that the 2 clothes did cost: set downe your three numbers thus.

The Example followeth in the next page.

Lib.	Clothes.	Lib.	
15	2	300.	2
		2	ø øø
		600	15 8 (40
			1

And than as you sée, you must multiply the 3 number which is 300 li by 2, which is the second number, and thereof commeth 600, the which 600 you must diuide by the first number 15, and you shall find in your quotient 40, which is 40 clothes, & so many clothes shall you buy for 300 li. as appeareth by practise héere aboue written. And héer you must mark that the first number and the third in this question be of one denomination, as before I haue declared, and likewise the 2 and the fourth numbers which you haue found, are of one semblance and likenes, but in case that the first number and the third in any question be not of like denominatiõ, you must (in working) bring them into one denomination, or nature, as in this ex-

ample

ample following. If 12 Nobles do gaine me 6 french crowns, how many French crownes will 48 pounds gaine me: Héere you sée that the denomination of the first number, is nobles, and the Denomination of the third is Pounds: wherefore, before you doe proceéd to worke by ỹ rule of thrée, you must first turne the pounds into nobles, in multiplying 48 poũd by 3, and they make 144 Nobles, for that there is in euery pound of money 3 Nobles: or otherwise if you will, you may bring the first number being 12 Nobles, into Poundes by diuiding them by 3, and thus shall your first and third numbers bée brought into one denomination: then shal you set downe your 3 numbers in order, thus.

If 12 nobles do gaine me 6 french crownes, what shall 144 Nobles gaine: the which 144 are the nobles which are in 48 li. Then multiply the third number 144, by the second number 6, and thereof commeth 864,

the

the which you must diuide by 12 nobles, and therof commeth 72 French Crownes.

And so many French Crowns will the 144 Nobles gaine me.

Nobles.	*Crownes.*	*Nobles.*
12.	6.	144.

144 × 6 = 864

XZØ
8Ø4
XZZ
X

Nobles.
(72

There is yet a more exact way whereby to worke in the rule of three, which is thus. You must marke if the third and first numbers in the rule of three, may both be diuided by one like diuisor: the which after you haue diuided thē, you shall write downe each of the quotients orderly in the said rule of 3, euery one of thē in his own place, as though those were 2 of the number of your question, and not changing the middle number, that is

to say ỹ second. As thus, if 50 crowns doe buy me 44 yardes of cloth, how many yardes shall I haue for 120 Crowns? Héere you may sée that the third and the first numbers, may bée diuided by 10, which in the 3 number is found 12 times, and in the first 5 times. Wherefore you shall put 12 for the 3 number in the rule of thrée, instead of 120: and 5 for the first number instead of 50, and let 44 remaine still in the midst, for the second number, after this sort as followeth, and then worke by the rule as before.

Crownes.	*Yardes.*	*Crownes.*
5.	44.	12.
	12.	
	88.	3
	44.	528 (105 $\frac{3}{5}$
	528.	888

You must multiply 44 by 12 and therof commeth 528: diuide the same 528 by 5, and you shall find in your quotient 105, $\frac{3}{5}$. and euen so many yards

yardes should you haue found, if you had wrought the rule of thrée, by the first numbers proposed. There is yet certaine other varieties in working by the rule of thrée, but for that they require the knowledge of fractions, & because they are not so easie as this first way, which is common, therfore content your selues with this same, vntil you haue learned the fractions, ỳ which by Gods helpe I intend to set forth in the second part of this booke, incontinently after that I haue first taught you the backer rule of thrée.

Of the backer rule of Three.

The backer rule of thrée is so called, because it requireth a contrary working to that, which the rule of thrée direct doth teach, wherof I haue now treated. For in the direct Rule of thrée, ỳ greater the third number is, somuch the greater will the fourth be But héere in this backer rule it is cõtrariwise, for the greater the 3 number,

ber is, ſo much leſſer will the fourth be. Then, whereas in the rule of thrée direct, the third number is multiplied by the ſecond, and the product thereof diuided by the firſt : héere you muſt multiply the ſecond number by the firſt, and diuide the product of ỹ ſame by the third, and the number which commeth in the quotient, anſwereth to the queſtion. For ſuch practiſe cõmeth often times in vſe : In ſuch ſort that if you ſhould worke the ſame by the rule of thrée direct, & not to haue a regard vnto the Proportion of the queſtion, you ſhould then commit an euident and open error.

Example.

If 15 ſhillings worth of Wine, will ſerue for the ordinary of 46 men when the Tunne of Wine is worth 12 pounds : for how many men will the ſame 15 ſhillings worth of wine ſuffice, when the Tunne of Wine is worth but 8 poundes ? It is cer-

taine

taine, that the lower the price is, that the Tunne of wine doth coſt, and ſo many more perſons will the ſaid 15 ſhillings of wine ſuffice. Therefore ſet downe your numbers thus : if 12 pounds ſuffice 46 men, for how many men will 8 pounds ſuffice ? you muſt multiply 46 by 12, and thereof commeth 552, the which you ſhall diuide by 8, and therof commeth 69, & vnto 69 men, will the ſaid 15 ſhillings worth in wine ſuffice, when ỹ Tun of Wine is worth but 8 Pounds, as hereafter doth appeare by practiſe.

Lib.	*Men.*	*Lib.*	
12.	46.	8.	
	12.		7
	92.	552	(69.
	46.	88	
	552.		

2. Likewiſe a meſſenger maketh a iourney in 24 daies, when the day is but 12 houres long : in how many

daies

daies shal he make the same iourney, when the day is 16 houres in length: Heere you may perceiue, that the more houres there are in a day, the fewer daies will the messenger bee in going his iourney. Therefore write downe your numbers thus, as heere you may see.

Howers.	*Dayes.*	*Howers.*	
12.	24.	16.	4
	12.		XZ
	48.		288
	24.		XÞÞ
	288.		X(18

And then multiply 24 dayes by 12 houres, and therof commeth 288: diuide the same 288, by the third number 16, & you shall find 18, the which is 18 daies, and in so many daies wil the Messenger make his Journey, when the day is 16 houres long.

Likewise, when the Bushell of wheat doth cost 3 shillings, the penny loafe of bread weigheth 4. lib.

I demaund what the same pennie lofe shall weigh, when the bushell of wheat is worth but 2 shilling? Here is to bee considered, that the better cheape the wheat is, the heauier shall the penny loafe weigh, and therefore write downe your 3 numbers, thus.

Shil. *Lib.* *Shil.*

3. 4. 2.

3. x 2 *Lib.*

12. 2 (6.

Then multiply 4 lib. which is the second nũber, by the first number 3, & they make 12, the which 12 you shall diuide by the third number 2 & therof commeth 6 li. & so much must the penny loafe of bread weigh, when the bushell of wheat is worth but 2 s. as may appeare. And now according to my former promise, shall follow the second part of Arithmeticke, which teacheth the working by Fractions.

Heere endeth the first part of *Arithmeticke.*

The second part of Arithmeticke, *which treateth of* Fractions or broken Numbers.

Chap. 1.

Of Fractions or broken numbers, & *the difference thereof.*

A Fraction or a broken number, is as much as a part, or many parts of 1, whereof there are two numbers with a line betweene them both, that is to say, the one which is aboue the line, is called the numerator, the other vnderneath the line, is called the denominator, as by exam. 3 quarters is called a fraction, which must be set downe thus, $\frac{3}{4}$, wherof 3 which is the higher number aboue the line is called the numerator, & 4 which is vnder the line, is called the denominator. And it is alwaies conuenient that the numerator bee lesse in number than the deno-

minator. For if the numerator, and the denominator be equall numbers, then shal they represent a whole number thus as $\frac{1}{1}, \frac{2}{2}, \frac{3}{3}$, which are whole numbers: by reason that the numerators of these, and all such like, may be diuided by their denominators, & the quotients wil alwaies be but 1. But in case that ỹ numerator of any fraction do excéd his denominator, then it is more than one whole: as $\frac{2}{1}\frac{9}{8}$, is more than a whole nũber by $\frac{1}{1}\frac{1}{8}$. And this is commonly called an improper fraction: other definition doth not héereunto appertaine. Furthermore it is to be vnderstood, that when the numerator is iust the halfe of the denominator, then the same broken nũber is the iust halfe of one whole, as $\frac{6}{12}, \frac{7}{14}, \frac{8}{16}, \frac{9}{18}$, & other like, are the halfes of one whole number whether it bée of money, of measure, of weight, or any other thing: whereof doth grow & come forth 2 progressions naturall: the one progreding by augmenting or increasing, as these.

$\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}, \frac{7}{8}, \frac{8}{9}, \frac{9}{10}$. &c.

And they do proceed infinitely and will neuer reach to make a whole nuuber, thus $\frac{1}{1}$. And the other progression, doth progredy by diminishing or decreasing, as thus.

$\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \frac{1}{8}, \frac{1}{9}, \frac{1}{10}$. &c.

And these doe proceed infinitely, & shall neuer come to make a 0. which signifieth nothing, but shall euer retaine some certain value of an vnity wherby it doth appeare that fractiõs, or broken numbers are infinite.

Chap. 2.

Of the reducing or bringing together of 2 Fractions, or many of *diuers denominations, vnto fractions of one like denomination.*

REduction, is as much as to reduce & bring together, or to put 2 or many numbers, being of diuers denominations the one from the other, into fractions of one denomination,

in reducing them vnto a common denominator, and the reason hereof is, For because the diuersitie and difference of the broken numbers do come of the denominators part, or of diuers denominators, and for the vnderstanding hereof, there is a generall rule whose operation or working is thus. Multiply the denominators of the fractions, the one by the other, and so you shall haue a new denominator cõmon to all the fractions, the which denominator you must diuide by the particular denominators of euery of the said fractions, and multiply euery quotient by his owne numerator, and so you shall haue new Numerators, for the numbers which you would reduce, as appeareth by this example following.

Reduction in common denomination.

Reduction. 1. 1 IF you will reduce $\frac{2}{3}$ and $\frac{4}{5}$ together, first make a crosse betweene the 2 fractions as here you see, & then you

you must multiply the two denominators the one by the other, as thus, 3 by 5 maketh 15, which is your common denominator, set that vnder the crosse, then diuide 15 by the denominator 3, and you shall haue 5, which multiply by the numerator 2, & you shall find 10, set that ouer the $\frac{2}{3}$ and they are $\frac{10}{15}$, for the $\frac{2}{3}$. Afterwards diuide 15 by the denominator 5, and thereof commeth 3, the which multiply by the numerator 4, and you shall find 12, which set ouer the head of the $\frac{4}{5}$, and they make $\frac{12}{15}$ for the $\frac{4}{5}$: as appeareth more plainer aboue in the margent.

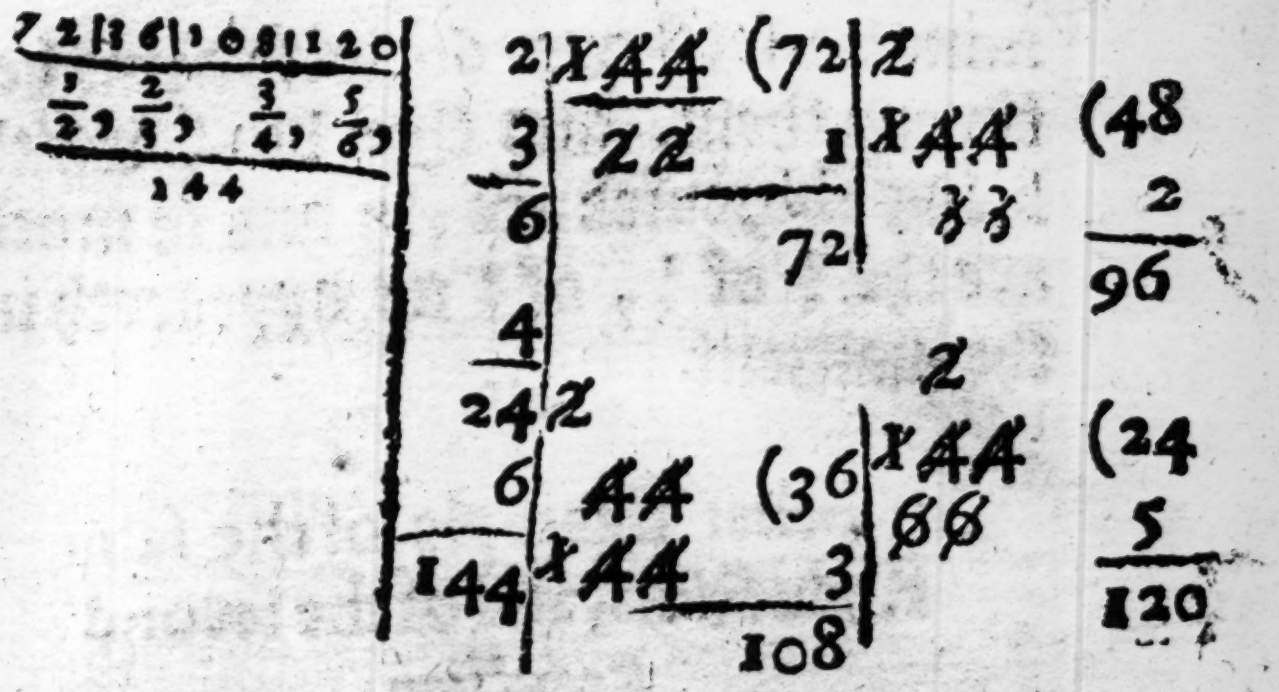


2. If you will reduce $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{5}{6}$, together, you must multiply all the denominators the one by the other, that is to say, 2 by 3 maketh 6: then 6 by 4 amounteth to 24. Last of all 24 by 6 and thereof commeth 144, for the cõmon denominator. Then, for the first *Reduction. 2.*

ction which is $\frac{1}{2}$ diuide 144 by the denominator 2, and thereof cõmeth 72, the which multiply by the numerator 1, & it is stil 72, set that ouer the $\frac{1}{2}$ and that is $\frac{72}{144}$, for the $\frac{1}{2}$: Thẽ diuide 144 by the second denominator 3, & thereof cõmeth 48: the which multiply by the second numerator 2, and they are 96, which set ouer the $\frac{2}{3}$, and they make $\frac{96}{144}$, for the $\frac{2}{3}$: Then diuide 144 by the third denominator 4, and thereof commeth 36, the which multiply by the third numerator 3, and they make 108, which set ouer the $\frac{3}{4}$, and they are $\frac{108}{144}$ for the $\frac{3}{4}$.

Finally diuided 144 by the last denominator 6, and thereof cõmeth 24: The which multiply by the last numerator 5, and thereof commeth 120 which set ouer the $\frac{5}{6}$, and they are $\frac{120}{144}$, for the $\frac{5}{6}$, as appeareth hære by practise.

The Example followeth in the next page.



Reduction of broken numbers of broken.

IF you will reduce ỹ broken of broken together, as thus, the $\frac{2}{3}$ of $\frac{1}{4}$, of $\frac{4}{5}$, you must multiply all the numerators, the one by the other to make one broken number of the three broken nũbers: that is to say, 2 by 1, maketh 2: and then 2 by 4, maketh 8, which 8 is your numerator. Then multiply the Denominators the one by the other, that is to say, 3 by 4, maketh 12, and then 12 by 5, maketh 60, for your denominator

8
2, 1, 4,
3 4 5
60.

Reduction. 3.

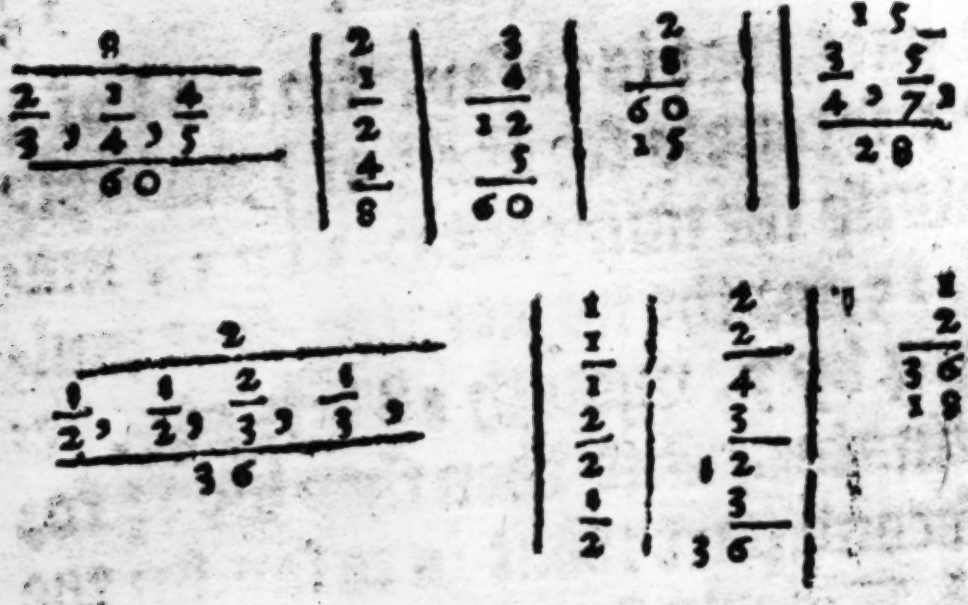
minator, set 8 ouer 60, with a line betweene them, and they be $\frac{8}{60}$ which being abbreuied are $\frac{2}{15}$, and so much are the $\frac{2}{3}$ of $\frac{1}{4}$, of $\frac{4}{5}$ as appeareth in the margent.

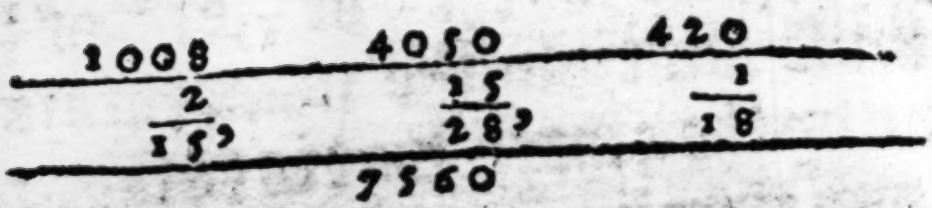
An other Example of the same Reduction, and of the second *Reduction.*

Reduction. 4. If you will reduce $\frac{2}{3}$ of $\frac{1}{4}$, of $\frac{4}{5}$, the $\frac{3}{4}$ of $\frac{5}{7}$: And the $\frac{1}{2}$, of the $\frac{1}{2}$, of the $\frac{2}{3}$ of $\frac{1}{3}$. First it behoueth you of euery party of the broken numbers, to make of each of them one broken: as by the third Reduction is taught: that is to say, in multiplying ỹ numerators by numerators, & denominators by denominators: First for the first part which is $\frac{2}{3}$ of $\frac{1}{4}$, of $\frac{4}{5}$, you must as is before said, multiply 2 by 1, and then by 4, and you shall haue 8 for the numerator, likewise multiply 3 by 4, & the product by 5, and you shall haue 60 for the denominator: so they make $\frac{8}{60}$ which being abbreuied are $\frac{2}{15}$, for the first

first part, that is to say, for the $\frac{2}{3}$ of $\frac{3}{4}$ of $\frac{4}{5}$: secondly for the $\frac{3}{4}$ of $\frac{5}{7}$ multiply likewise the numerator 3 by 5, maketh 15, for the numerator. And multiply 4 by 7, maketh 28, for the denominator. And then they bée $\frac{15}{28}$ for the second part: that is to say, for the $\frac{3}{4}$ of $\frac{5}{7}$. Thirdly for the $\frac{1}{2}$ of $\frac{1}{2}$, of $\frac{2}{3}$, of $\frac{1}{3}$ you must multiply the numerators the one by the other, that is to say, 1 by 1, and then by 2, and last by 1, and all maketh but 2 for the numerator: likewise multiply the denominators 2 by 2, maketh 4, and 4 by 3 maketh 12, and then 12 by 3 maketh 36, for the denominator: and they are $\frac{2}{36}$, which being abbreuied maketh $\frac{1}{18}$ for the third part, that is to say, for $\frac{1}{2}$ of the $\frac{1}{2}$, of $\frac{2}{3}$ of $\frac{1}{3}$. Last of all take the $\frac{2}{15}$, the $\frac{15}{28}$, and the $\frac{1}{18}$, and reduce them according to the order of the second reduction, and you shall find $\frac{1008}{7560}$ for the $\frac{2}{15}$. And $\frac{4050}{7560}$ for the $\frac{15}{28}$. And $\frac{420}{7560}$ for the $\frac{1}{18}$: and thus are broken numbers of broken reduced, as appeareth by practise.

Reduction.





15	2Ø2		XS		
28	7S ØØ	(504	3ØØ		
120	1S8S	2	7S ØØ	(270	
30	XX	1008	2888	15	
420			ZZ	1350	
18				270	
3360				4050	
420					
7560					

X		
33Ø		
7S ØØ	(420	
1888	1	
XX	420	

Reduction of broken numbers, and the parts of broken together.

Reduction. 5.

IF you will reduce $\frac{1}{3}$, and the $\frac{1}{2}$ of $\frac{1}{3}$, together, to bring them into one broken number, you must first set downe the $\frac{1}{3}$ and $\frac{1}{2}$ as appeareth in the margent with a crosse betweene them, & then multiply the two denominators, the the one by the other, that is to say, 2 by 3 maketh 6, set that vnder the crosse, then multiply ỹ first numerator 1, by the last denominator 2, & that maketh 2 vnto ỹ which ad the last numerator 1, & they be 3, which set aboue the crosse, so you shall find that $\frac{1}{3}$ & the $\frac{1}{2}$ of $\frac{1}{3}$, do make $\frac{3}{6}$ which being abbreuied doth make $\frac{1}{2}$, which is as much as the $\frac{1}{3}$ and the $\frac{1}{2}$, of $\frac{1}{3}$, being reduced into one fraction.



Likewise if you will reduce the $\frac{2}{3}$ and the $\frac{1}{4}$ of $\frac{1}{3}$, you must doe as before, set downe the $\frac{2}{3}$ and $\frac{1}{4}$, with a crosse betweene

betwéen them, then multiply the two denominators the one by the other, ỹ is to say 3 by 4 maketh 12: which set vnder the crosse, as you sée in the margent: and then multiply the first numerator 2, by the last denominator 4, and thereof commeth 8, whereunto adde the last numerator 1, & that maketh 9, which 9 set ouer the crosse: so shall you find that the $\frac{2}{3}$ and the $\frac{1}{4}$ of $\frac{1}{3}$, are worth $\frac{9}{12}$, the which abbreuied doe make $\frac{3}{4}$ as appeareth by example in the margent.



Reduction of whole Numbers and broken together in a Fraction, *the which fraction is called an improper fraction.*

Reduction. 6.

If you will reduce whole number and broken, into broken, you shall reduce the whole number into broke, as by this example may appeare: if you will reduce $17\frac{5}{8}$ into a broken number, first you must multiply the whole number 17 by the denominator of the broken, which is 8, in saying 8 times 17, doe make 136, unto the which you must ad the numerator of $\frac{5}{8}$ which is 5, and all amounteth to 141, which set ouer $\frac{5}{8}$, with a line betweene them, and they wil be $\frac{141}{8}$ so much is $17\frac{5}{8}$ worth in an improper fraction, as appeareth heere by practise.

17	141		
8	17 $\frac{5}{8}$		
136		maketh	$\frac{141}{8}$
5			
141			

In

In case you haue whole number & broken, to be reduced with brokẽ, you must bring the whol number into his broken, in multiplying it by the denominator of the broken number going therewith, and adde thervnto the numerator of the said brokẽ number, as in the last example is declared, and then reduce that broken number with the other broken, as hære appeareth by this example. Reduce $10\frac{2}{3}$ and $\frac{4}{7}$, together, first bring $10\frac{2}{3}$ all into thirds, as it is taught by the Sirt Reduction, and you shall find $\frac{32}{3}$, then reduce the $\frac{32}{3}$ and $\frac{4}{7}$ together, by the first reduction, and you shall find $\frac{224}{21}$, for the $\frac{32}{3}$: and $\frac{12}{21}$ for $\frac{4}{7}$ as appeareth hære by practise.

$$\frac{32}{10\frac{2}{3}} \quad \frac{224}{\frac{32}{3}} \qquad \frac{12.}{\frac{4}{7}} \quad \begin{matrix} 32. & 4. \\ 7. & 3. \end{matrix}$$

21 224 12

Also in case you haue in both parts of

of your reduction, as well whole nũber as broken, you must alwaies put the whole of each part into his brokẽ as by the 6 Reduction is taught.

Example.

If you will reduce $12\frac{1}{4}$ with $14\frac{2}{3}$, to bring them into one denominatiõ first bring the $12\frac{1}{4}$ all into fourths, & you shall find $\frac{49}{4}$: then likewise reduce $14\frac{2}{3}$, all into thirdes, and you shall haue $\frac{44}{3}$, for the $14\frac{2}{3}$: then reduce $\frac{49}{4}$, and $\frac{44}{3}$, together, by the order of the first reduction, and you shall find $\frac{147}{12}$, for the $\frac{49}{4}$. And $\frac{176}{12}$ for the $\frac{44}{3}$: as here by practise doth plainly appeare.

$$\frac{49}{12\frac{1}{2}} \quad \frac{44}{14\frac{2}{3}} \quad \frac{147}{\frac{49}{4}} \quad \frac{176}{\frac{44}{3}} \qquad 12$$

The

Abbreuiation.

Chap. 3

Of abbreuiation of one broken number into a lesser broken.

ABbreuiation is as much as to set downe, or to write a broken nũber by figures of lesse signification, and not diminishing the value thereof. The which to doe, there is a rule whose operation is thus, diuide the numerator, & likewise the denominator, by one whole number, the greatest that you may find in the same broken number, & of the quotient of that numerator, make it the numerator, and likewise of that of the denominator, make it your denominator, as by example.

1 If you will abbreuiate $\frac{54}{81}$, you shall vnderstand that ỹ greatest whole number that you may take, by the which you may diuide the numerator and the denominator is 27, which is the halfe of the denominator, & that is a whole number, for you cannot take

take a whole number out of the denominator 81, which will diuide both the numerator & denominator, but that there will bée either more or lesse than a whole number, therfore if you diuide 54 by 27, you shall find in the quotient 2 for the numerator: likewise if you diuide 81 by 27, you shall haue in the quotient 3, for the denominator: then put a ouer the 3, with a line betwéene them, and you shall find $\frac{2}{3}$, and thus by this rule the $\frac{54}{81}$ are abbreuied vnto $\frac{2}{3}$: as appeareth in the margent, and so is to bée vnderstanded of all other.

$\frac{54}{81}$

$\frac{2}{3}$

The forme and manner how to find the greater number, by the which you *may wholy diuide the numerator and denominator, (to the end ye may abbreuiate them) is thus.*

First diuide the denominator by his numerator, & if any number do remaine, let your diuisor be diuided by the same number, & so you must continue vntill you haue so oftentimes diuided, that there may nothing remain, then it is to be vnderstood, that your last diuisor (whereat ysu did end and that 0 did remain after your last diuision) is the greatest number, by ỹ which you must abbreuiat, as you did in the last exãple. But in case ỹ your last diuisor be 1, it is a token that the same nũber cannot be abbreuied to any lower fraction thã you find it at ỹ first. Exam. of $\frac{54}{81}$: diuide 81, which is the denominator by 54, which is his numerator, and there resteth 27, then diuide 54 by 27, and there remaineth 0, which is nothing, wherefor your

last

laſt diuiſor 27 is the number by the which you muſt abbreuiate $\frac{54}{81}$: as in the laſt example is ſpecified.

Another manner of Abbreuiation.

2 Mediate the numerator and alſo the denominator of your Fraction in caſe the numbers be euen, that is to ſay, take alwaies of the halfe of the numerator & likewiſe of the denominator, and of the mediation or halfe of ỹ numerator, make it your numerator, alſo of halfe ỹ denominator make your denominator, & ſo cõtinue as often as you can in taking alwaies the halfe of the numerator, & likewiſe of the denominator: or elſe ſée if you may abreuiate the numbers which doe remaine, by 3, by 4, by 5, 6, 7, 8, 9, or by 10: for you muſt abreuiate them as often as you can by any of the ſaid numbers. And it is to be noted, that with whatſoeuer nũber of theſe, you doe abreuiate the numerator of your fraction, by the ſame you muſt abre-

uiate likewise the denominator, so continuing vntil they can no more be abbreuied. And it is to be vnderstood, that if the numerator and the denominator be euen nũbers, as you may know when the first figure is an enen number, or a 0, thẽ you may perceaue if both the numerator and the denominator may be abbreuied by 10, by 8, by 4, or by 2: albeit that sometimes they may be abbreuied by 3. And if they be odde numbers, then must you cõsider if they may be abbreuied by 9 by 7, by 5, or by 3: but when the first number, aswell of the numerator, as of the denominator are euen nũbers, then may you well know that such numbers may be abbreuied by 2, as is aforesaid. And if you ad the figures of ỹ numerator together, in such manner as you doe in making the prowfe by 9 in whol numbers: that is, if you find 9, it appeareth that you may abbreuy that number by 9. And likewise by 3, and sometime by 6, if you find 6 it may be abbreuied by 6, and

alwaies

alwais by 3 if you find 3, it is a signe that you abbreuiate by 3, & by whatsoeuer nũber that you doe abbreuiate the numerator, by the same must you abreuiate likewise the denominator: and if the first figures of the same nũber be 5, or 0, you may abbreuiate thẽ by 5, but if the first figures be both 0, they may be abbreuied by 10, in cutting away the two ciphers thus, as $\frac{2}{3}|\frac{0}{0}$ which maketh $\frac{2}{3}$, and sometimes by 100, thus, as $\frac{1}{2}|\frac{00}{00}$, in cutting away the foure ciphers after this sort, $\frac{1}{2}|\frac{00}{00}$ and then the $\frac{100}{200}$ do make $\frac{1}{2}$, and after this manner haue I set heere diuers examples: although that all broken numbers cannot be abbreuied by this rule, yet all fractions may be well abbreuied by the first rule aforesaid.

Abbreuied.

$\frac{384}{768}\frac{40}{80}$ by 10.
$\frac{384}{768}\frac{48}{88}$ by 8.
$\frac{48}{96}$ by 6.
$\frac{8}{16}$ by 4.
$\frac{2}{4}$ by 2.
$\frac{1}{2}$

$\frac{189}{472}\frac{90}{95}$ by 9.
$\frac{210}{525}$ by 7.
$\frac{30}{75}$ by 5.
$\frac{6}{15}$ by 3.
$\frac{2}{5}$

3 Furthermoze, you ſhall vnder-ſtand that ſometimes it happeneth, that all the figureo of the numeratoz are equall vnto them of the denomi-natoz, which when it ſo happeneth, you may then take one of them of the numeratoz, & alſo one of them of the denominatoz, and it ſhall be abzeuied as $\frac{555}{888}$, being abzeuied after this mã-ner cõmeth to $\frac{5}{8}$. And yet it happeneth ſometimes, that 2 oz many figures of the numeratoz are pzopoztioned vnto 2, oz many figures of their denomi-natozs, and that the other figures of the ſame number are the figures one to the other is this pzopozcõ follow-ing

ing. Then may you take two or more figures, aswell of the numerator, as of the denominator, & by this manner the same number shall be abbreuied, as $\frac{47}{59}\frac{47}{59}$ being abbreuied by this rule, do come to $\frac{47}{59}$.

4 Also it happeneth sometimes, that you would abreuiat one number vnto the semblance or likenesse of an other: And for to know if the same may bée abbreuied, and also by what number it may be abreuied, you must diuide the numerator of the one number, by the numerator of the other: & likewise the denominator of the one, by the denominator of ỹ other, for in case that after euery diuision there do remaine o and that the two quotiẽts be equall, then is one of them the nũber by the which the said fractiõ must be abreuied, as by example of $\frac{115}{207}$. I would know if they may bée abreuied vnto $\frac{5}{9}$, and for to doe this, you must diuide 115 by 5, and you must diuide 207 by 9, and there will

come into both the quotients 23 : by the which it appeareth that this number may be abbreuied by 23.

1 0
11 5/20 7 1 1 5 2 0
5/9 5 5 (23 2 0 7
0 0 (23

Chap. 4.

Of the adding of two or many broken numbers together, as by example.

TO adde Fractions or broken nũbers together, there is a generall Rule, which is thus. If the nũbers be of vnlike denominations the one to the other, you must reduce thẽ into a common denomination by the doctrine of the first reduction: & when you haue reduced them, you must then adde both the numerators together, and set the product of the said additiõ ouer the crosse, and diuide the same Numerator by the common denominator

nator, as by this example following.

1 If you will adde $\frac{2}{3}$ with $\frac{3}{4}$, you must first reduce the two Fractions both into one denominatiõ, according to the order of the first reduction, that is to say, in multiplying the denominator of the first fraction which is 3 by the denominator of the other fraction which is 4, and they make 12 for your common denominator: the 8 which 12 you shall set vnder the crosse, then multiply the first Numerator 2, by the last denominator 4: and thereof commeth 8, which set ouer the $\frac{2}{3}$, and



then multiply ỹ last numerator 3, by the first denominator 3, and thereof commeth 9, which you must set ouer the $\frac{3}{4}$: then ad the numerator 8, with the numerator 9, and they make 17, which set ouer the crosse, & then your

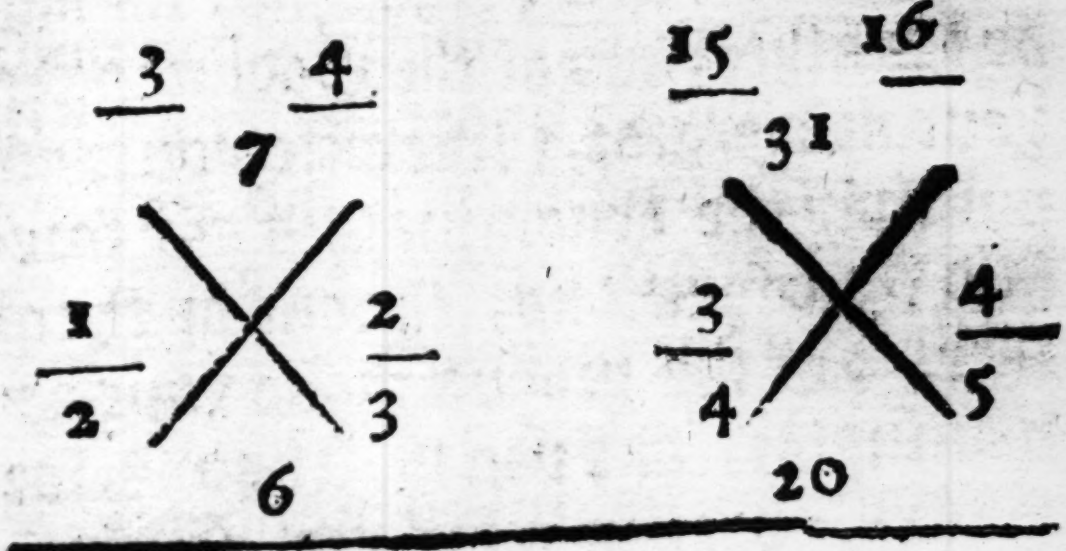
fraction

fraction will be $\frac{17}{12}$: which is the addition of the $\frac{2}{3}$ with $\frac{3}{4}$. And because the numerator 17, is greater than his denominator 12, therefore you must diuide 17 by 12, and thereof will come 1, & 5 remaining, which 5 you must set apart, and 12 vnder the same with a line betweene them, and they are worth $\frac{5}{12}$, and so much are the $\frac{2}{3}$ added with $\frac{3}{4}$, as doth appeare.

Addition in broken numbers.

2. Also if you will ad $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, and $\frac{4}{5}$ together you must first add the $\frac{1}{2}$ and $\frac{2}{3}$ together, according to ỹ doctrine of ỹ last rule, & you shall find $\frac{7}{6}$: then adde $\frac{3}{4}$ and $\frac{4}{5}$ together by the said last rule, and they make $\frac{31}{20}$. Then finally adde the $\frac{7}{6}$ (which came of the $\frac{1}{2}$ & $\frac{2}{3}$ added together) with $\frac{31}{20}$, which came of the $\frac{3}{4}$ and $\frac{4}{5}$ added together, and you shall find by the aforesaid Addition that they amount vnto $\frac{326}{120}$. Wherefore diuide 326 by 120 and there ẽ cõmeth 2 and 86 remaineth which is $\frac{86}{120}$ of one

one whole, and they being abreuied do make $\frac{43}{60}$, and thus the $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, and $\frac{2}{5}$ being added together do amount to 2 and $\frac{43}{60}$, as héere vnder doth appeare.



Addition of broken number of broken.

3. Furthermore, if you will ad the broken numbers of broken together as

as to ad the $\frac{2}{3}$ of $\frac{1}{4}$ of $\frac{4}{5}$, with the $\frac{5}{5}$ of $\frac{1}{2}$ of $\frac{5}{8}$: firſt you muſt reduce the nũbers according to the order of the Fourth Reduction, in multiplying the numeratorꝛs of the firſt 3 fractions, the one by the other, and of the prodꝛuct make your numeratorꝛ, & likewiſe you muſt multiply the denominatorꝛs of ỹ forꝛeſaid thrée fractions, the one by the other, & of the prodꝛuct make your denominatorꝛ, and you ſhall find $\frac{24}{60}$, forꝛ the firſt 3 brꝛoken numbers, ỹ which being abbrꝛeuied doe make $\frac{2}{5}$ then reduce the other 3 fractions, by the ſaid fourth reduction, in multiplying the numeratorꝛs by numeratorꝛs, & denominatorꝛs by denominatorꝛs, as you did by the firſt 3 brꝛoken numbers aforeſaid, and you ſhall find $\frac{25}{96}$ then muſt you ads the $\frac{2}{5}$ which came of the firſt 3 brꝛoken numbers, and $\frac{25}{96}$ which are come of the laſt 3 fractions, both together, by the inſtruction of the firſt addition: & you ſhall find $\frac{1}{4}\frac{7}{8}$: which cannot be abbrꝛeuied, but is the iuſt prꝛsduct of the addition: ſo much are $\frac{2}{3}$

of

of $\frac{3}{4}$ of $\frac{4}{5}$ added with the $\frac{5}{6}$ of $\frac{1}{2}$ of $\frac{5}{8}$ as hereafter by practise doth euidently appeare.

24		25
$\frac{2}{3}$, $\frac{3}{4}$, $\frac{4}{5}$,		$\frac{5}{6}$, $\frac{1}{2}$, $\frac{5}{8}$,
60	$\frac{2}{5}$	96

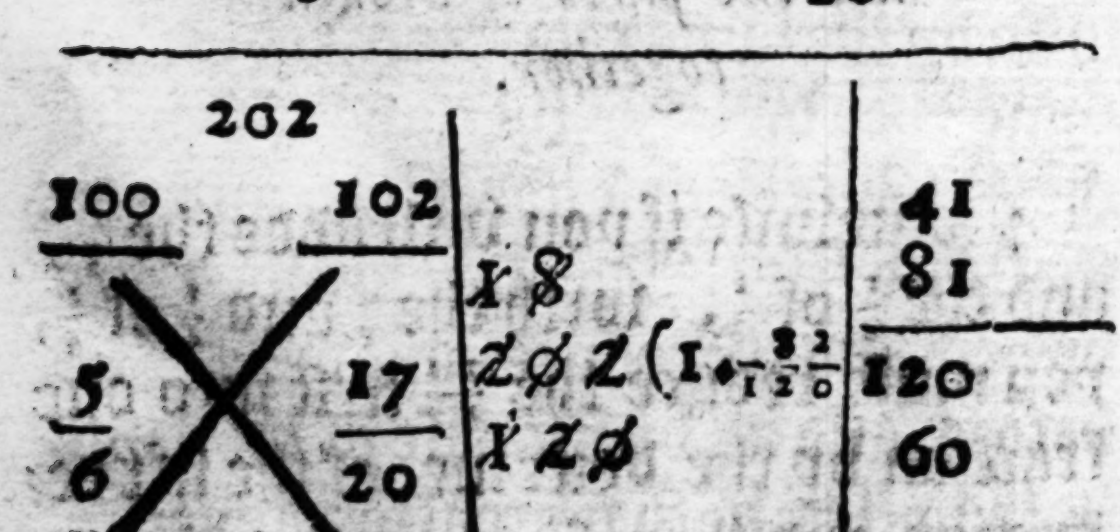
317		
192		125
2	25	317
5	96	480
	480	

Addition of broken Number and parts of broken, with broken, *and the parts of broken together.*

4 Likewise if you will adde the $\frac{2}{3}$, and the $\frac{1}{2}$ of $\frac{1}{3}$, with the $\frac{4}{5}$ and $\frac{1}{4}$ of $\frac{1}{5}$, you must reduce the $\frac{2}{3}\frac{1}{2}$ first into one fraction by the doctrine of the fift reduction, and therof commeth $\frac{5}{6}$, for the $\frac{2}{3}$ and

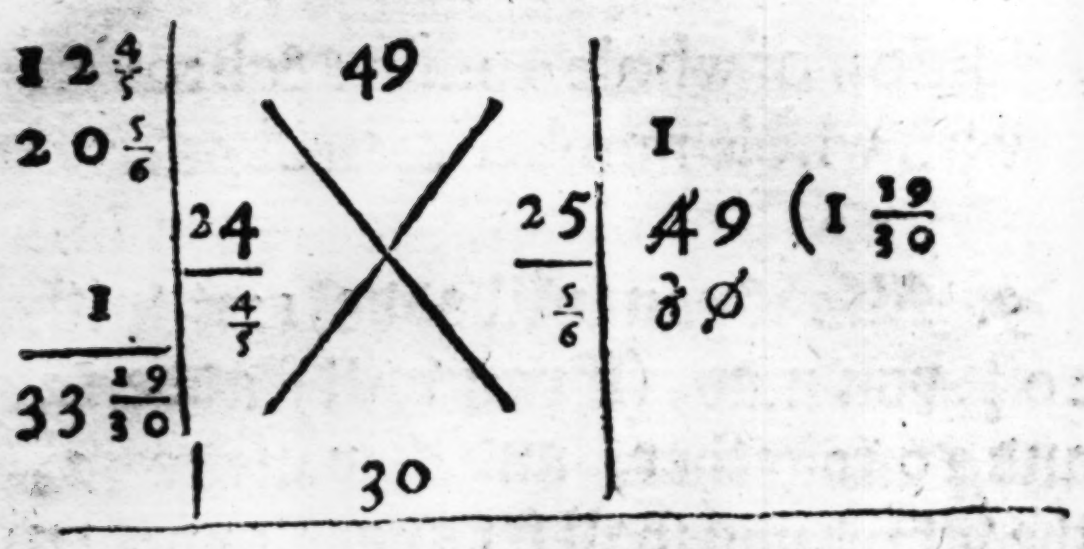
$\frac{2}{3}$ and $\frac{1}{2}$ of one of the ſaid thirds: then reduce the $\frac{4}{5}$ and $\frac{1}{4}$ by the ſaid fifft reduction, and thereof commeth $\frac{17}{20}$.
Laſt of all adde the $\frac{5}{6}$ and $\frac{17}{20}$ together accoꝛding to the firſt rule of addition, and you ſhall find $\frac{202}{120}$, which béeing diuided bꝛingeth 1, and $\frac{82}{120}$ part remaining, which abꝛeuied maketh $\frac{41}{60}$, and thus you doe perceiue that the $\frac{1}{1}$ and $\frac{1}{2}$ of $\frac{1}{3}$, added with the $\frac{4}{5}$ & $\frac{1}{4}$ of $\frac{1}{5}$, do amount vnto 1 $\frac{41}{60}$, as héereafter by pꝛactiſe doth plainly appeare.

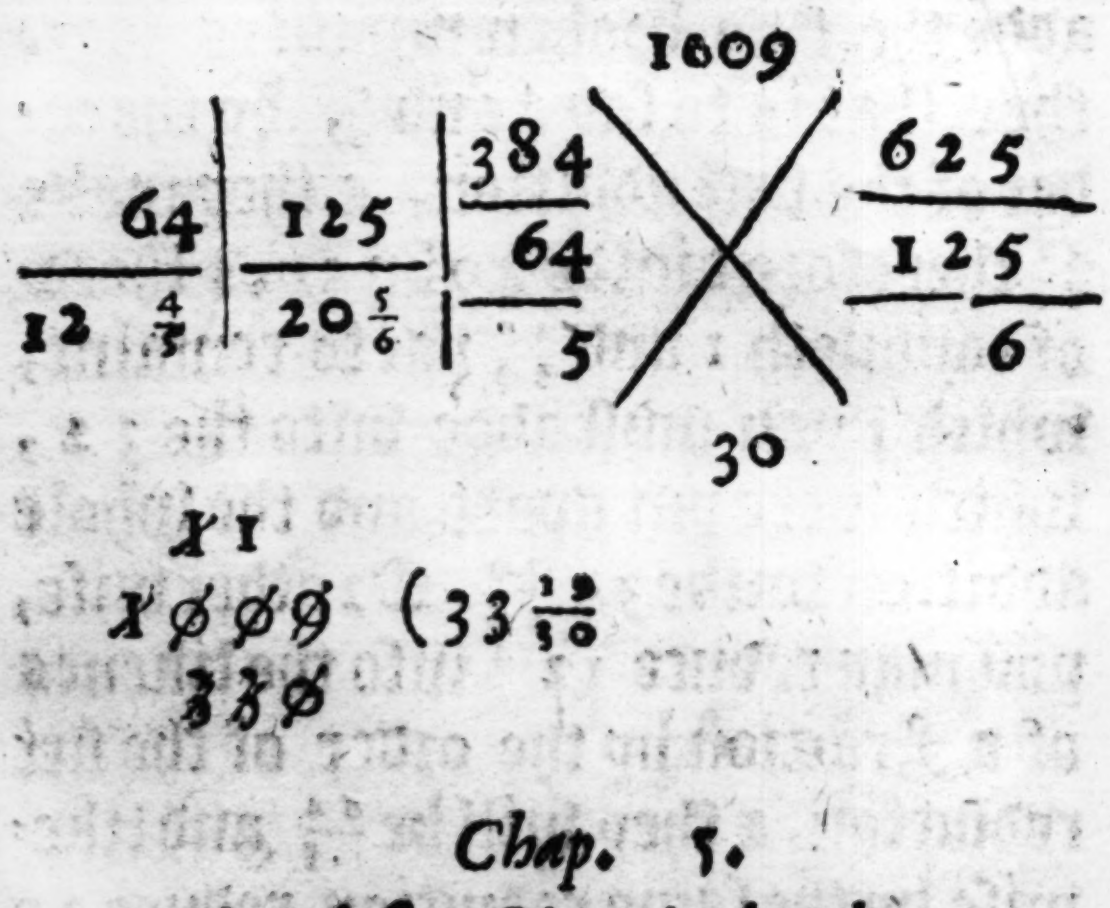




Addition of whole number & broken with whole number & broken.

5. Also if you will adde 12 $\frac{4}{5}$ with 20 $\frac{5}{6}$, you may, (if you will) adde 12 and 20 together, and they make 32, the which you shall set apart, and then adde the two broken numbers together, that is to say $\frac{4}{5}$ and $\frac{5}{6}$, by the order of the first addition, & they make $\frac{49}{30}$ therefore diuide 49 by 30, & thereof commeth 1 and $\frac{19}{30}$ parts remaine, which 1 you must adde vnto the 32, which were put apart, and the whole addition wilbe 33 $\frac{19}{30}$. Or otherwise, you may reduce 12 $\frac{4}{5}$ into the likenes of a Fraction by the order of the first reduction, & they will be $\frac{64}{5}$ and likewise by the same reduction, reduce 20 $\frac{5}{6}$ and they be $\frac{125}{6}$, then adde $\frac{64}{5}$ with the $\frac{125}{6}$, by the first addition, and you shall find $\frac{1009}{30}$. Therfore diuide 1009 by 30, and thereof commeth 33 $\frac{19}{30}$ as before, and as by practise of the same both waies doth hereafter appeare.





Chap. 5.

Of Subſtraction in broken Numbers.

1 IF you will ſubſtract 2/3 from 3/4, you muſt firſt reduce both the fractions into a common denomination, by the doctrine of the firſt reduction, and you

you shall find $\frac{8}{12}$ for the $\frac{2}{3}$, and $\frac{9}{12}$ for the $\frac{3}{4}$. Therfore abate the numerator 8 from the numerator 9, & there will remaine 1, which 1 you must set ouer the crosse, & the same is $\frac{1}{12}$, & so much is the rest of that substraction, as may appeare heere by practise.

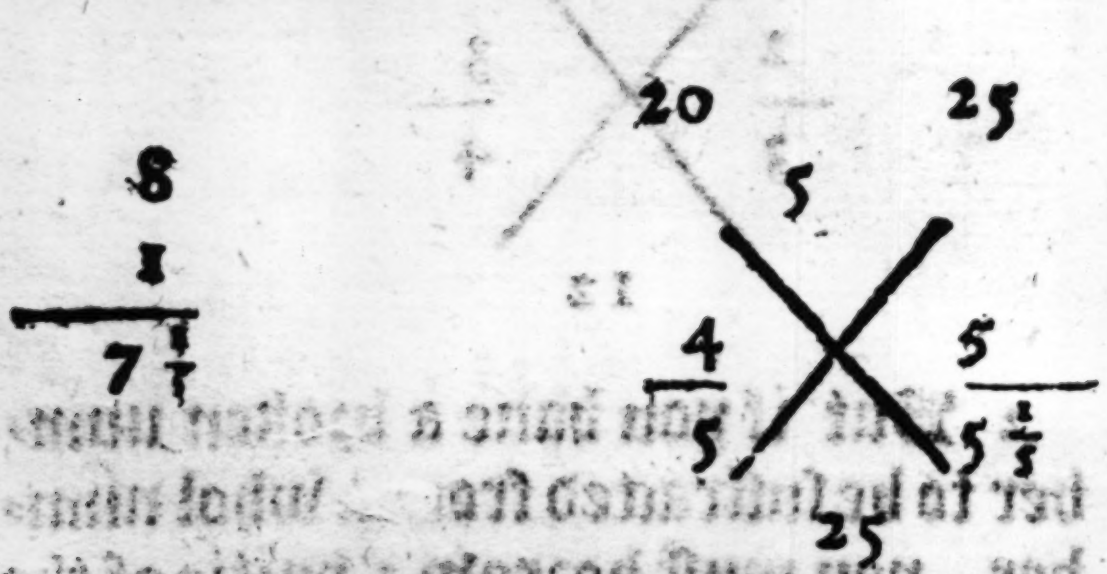
$$\frac{8}{\quad} \qquad \frac{9}{\quad}$$

$$\frac{2}{3} \qquad \frac{3}{4}$$

1 over the cross; 12 under the cross.

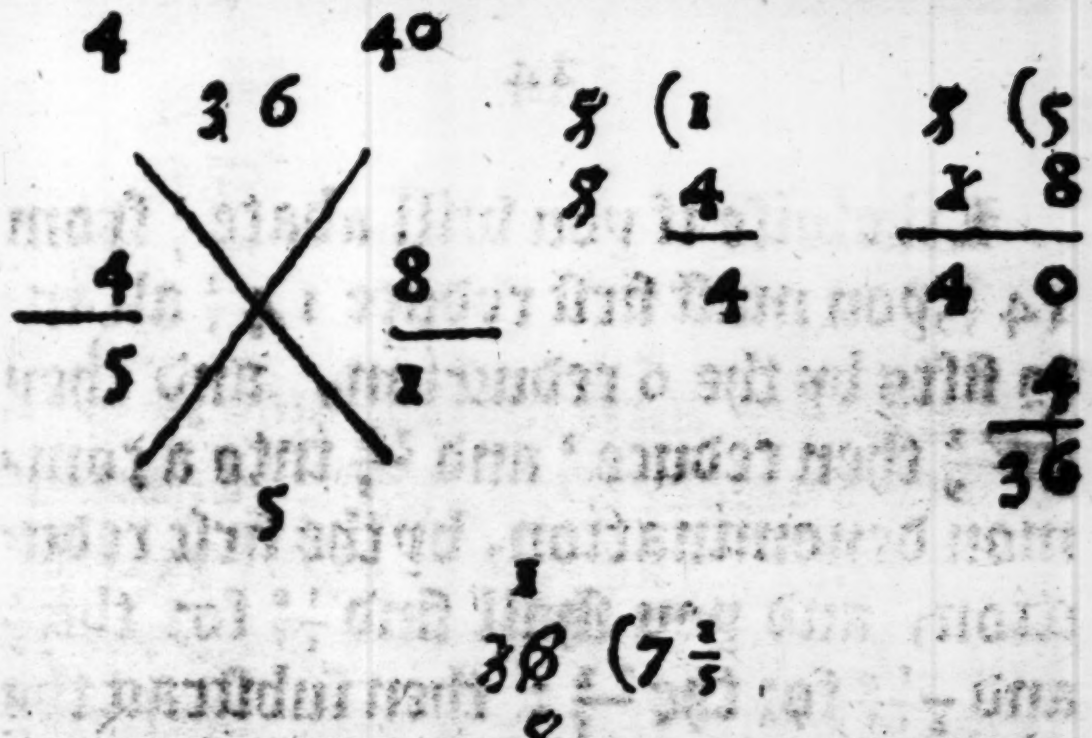
2 But if you haue a broken number to be substracted from a whol number, you must borrow 1 vnitie of the whole number, and resolue it into a fraction of like denomination, as is that fraction which you would abate from the same whole number, and then abate the said fraction therfrom, & you shall find what doth remaine, as by this exãple. If you abate $\frac{4}{5}$ from

8, you must borrow one of the said 8, and resolue it into fifts like vnto the fraction, because it is $\frac{4}{5}$, & that 1 will be 5 fifts thus $\frac{5}{5}$ therfore abate $\frac{4}{5}$ from $\frac{5}{5}$ and there will remaine $\frac{1}{5}$, and substract the 1 which you borrowed from 8 and there doth remaine 7: and the $\frac{1}{5}$ also which remained after the said $\frac{4}{5}$ were abated. Thus the $\frac{4}{5}$ being substracted from 8, doth leaue 7 $\frac{1}{5}$ as by practise doth plainly appeare.



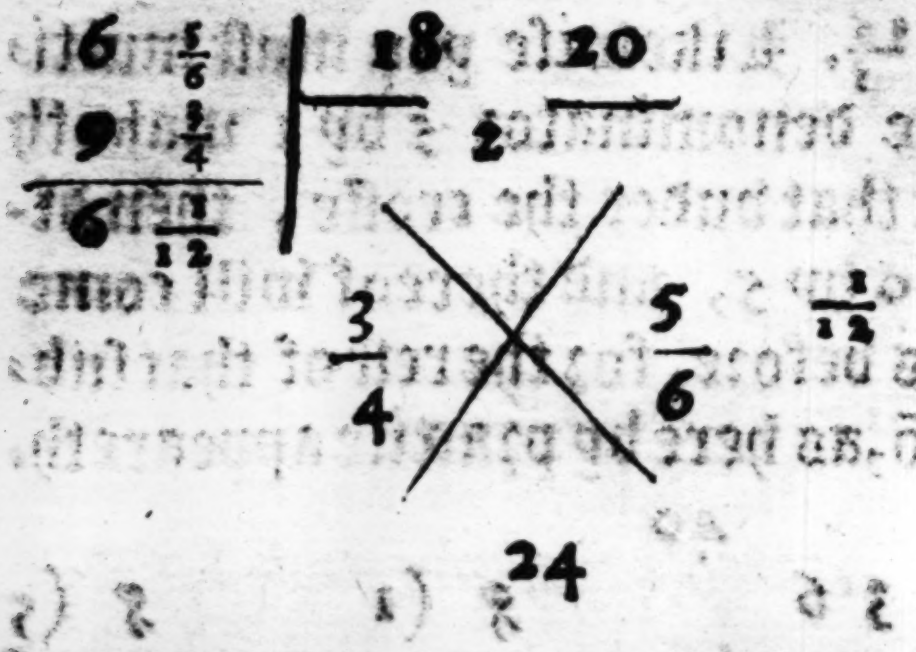
Or otherwise you shall put 1 vnder 8 with a line betweene, & that wil be $\frac{8}{1}$: then set downe the $\frac{4}{5}$ and the $\frac{8}{1}$ with a crosse betweén them, then you must reduce them into one denomination by the first reduction, and you shall find 4 ouer the $\frac{4}{1}$, and 40 ouer the $\frac{8}{1}$, then

then subtract the saio 4 from 40, and there will remaine 36, the which you shall set ouer the crosse, and they doe make $\frac{36}{5}$. Likewise you must multiply the denominator 5 by 1 maketh 5, set that vnder the crosse, then diuide 36 by 5, and thereof will come $7\frac{1}{5}$, as before, for the rest of that subtractiõ, as here by practise appeareth.

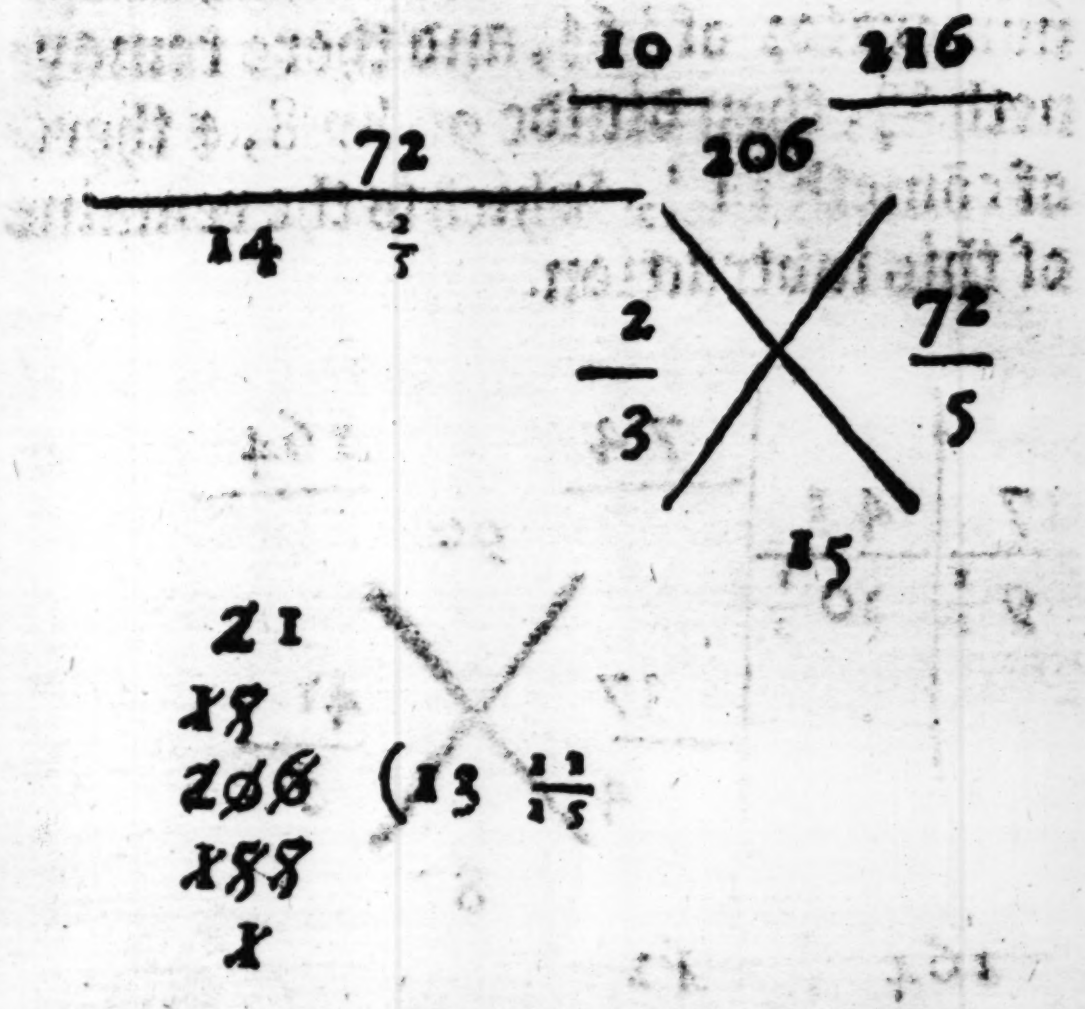


3 If you will subtract broken number from whole number and broken: as if you would subtract $\frac{3}{4}$ from $6\frac{5}{6}$, you may by the first subtractiõ, abate $\frac{3}{4}$ from $\frac{5}{6}$, and there will remaine $\frac{1}{12}$, & the 6 doth still remain whole, because the $\frac{3}{4}$ may well bee abated from the $\frac{5}{6}$,

and thus $\frac{3}{4}$ being abated from $6\frac{5}{6}$ leaueth $6\frac{1}{12}$, as appeareth by practise.

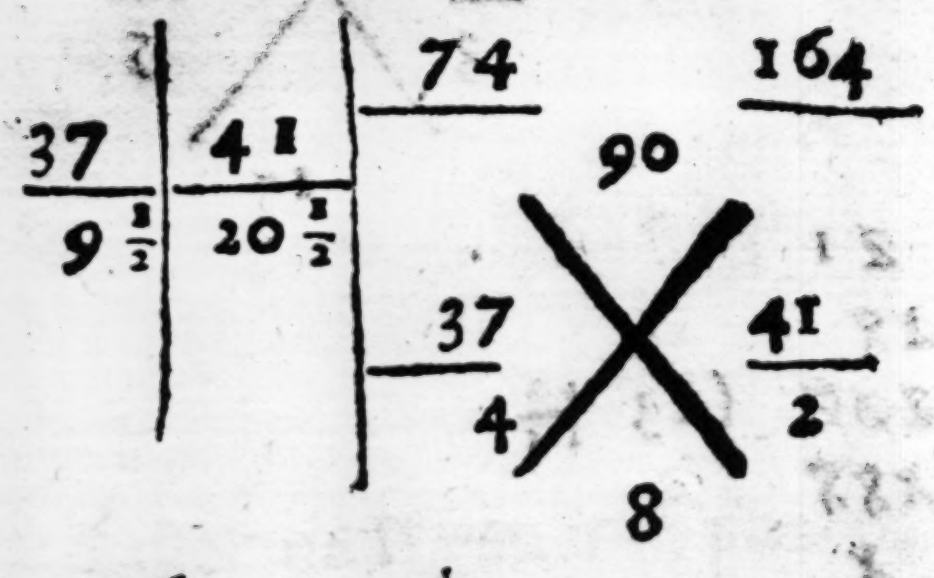


Likewise if you will abate $\frac{2}{3}$ from $14\frac{2}{5}$ you must first reduce $14\frac{2}{5}$ all into fifts by the 6 reduction, and they be $\frac{72}{9}$ then reduce $\frac{2}{3}$ and $\frac{72}{5}$ into a common denomination, by the first reduction, and you shall find $\frac{10}{15}$ for the $\frac{2}{3}$ and $\frac{216}{15}$ for the $\frac{72}{5}$: then subtract the numerator 10 of the first fraction, frō 216 of the second fraction, & there remaineth $\frac{206}{15}$. Therefore diuide 206 by 15, and thereof commeth $13\frac{11}{15}$, & so much remaines of this subtraction as may appeare in the next page following.



4 If you will ſubtract whole number and broken, from whole and broken, as thus, if you will ſubtract $9\frac{1}{4}$, from $20\frac{1}{2}$, you muſt reduce $9\frac{1}{4}$ into fourths, and likewiſe the $20\frac{1}{2}$ into halfes, by the firſt reduction: and you ſhall find $\frac{37}{4}$ for the $9\frac{1}{4}$, and $\frac{41}{2}$ for the $20\frac{1}{2}$. Then reduce $\frac{37}{4}$, and $\frac{41}{2}$ into one Denomination, according unto the firſt reduction, and you ſhall find $\frac{74}{8}$ for the $\frac{37}{4}$, and $\frac{164}{8}$ for the $\frac{41}{2}$ then abate the numerator of $\frac{74}{8}$,

which is 74 from 164, which is the numerator of $\frac{164}{x}$, and there remayneth $\frac{90}{8}$, then diuide 90 by 8, & thereof cõmeth 11 $\frac{1}{4}$, which is the remaine of this subtraction.



164 X2

74 90 (11 1/4

90 88

Subtraction of broken numbers of broken, from fractions of fractions.

5 If you will subtract the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$, from the $\frac{5}{6}$ of $\frac{3}{4}$ of $\frac{7}{8}$, you must first bring the $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{7}$ into one fraction, by the 3 reduction: and the $\frac{5}{7}$ of $\frac{3}{4}$ of $\frac{7}{8}$, likewise into one fraction by the same Reduction, and you shall find $\frac{6}{10}$ for the

the first 3 broken numbers, which being abbreuied do make $\frac{1}{5}$: and for the other 3 broken numbers, you shall find $\frac{105}{192}$: which beeing likewise abbreuied doe make $\frac{35}{64}$: then you shall subtract $\frac{1}{5}$ from $\frac{35}{64}$ by the instruction of the first Subtraction, in reducing both the fractious into a common denomination, as before is done, and you shall find remaining $\frac{111}{320}$, as may appeare by example.

6		105
$\frac{1}{2}$ $\frac{2}{3}$ $\frac{3}{5}$	$\frac{1}{5}$	$\frac{5}{6}$ $\frac{3}{4}$ $\frac{7}{8}$
30		192 $\frac{35}{64}$

64 175

111

1 — $\frac{35}{64}$

320

175
64
111

Chap. 6.

Of Multiplication in broken Numbers.

FIrst for to multiply in broken Number, there is a Rule which is thus, you must multiply the numerator of the one fraction, by the numerator of the other. And likewise you must multiply the Denominator of the one, by the denominator of the other. And then diuide the fraction if it may be diuided, or else abbreuiate it, if it may be abreuied, and it is done. But if there bee whole number and broken together, you must reduce the whole numbers into their broken, & adde thereunto the numerator of his broken, & then multiply as is before sayd, as also hereafter by examples shall more plainely appeare.

1 If you will multiply $\frac{2}{3}$ by $\frac{3}{4}$, you must multiply the numerator 2 by the numerator 3, and therof commeth 6, for the numerator. Likewise you must multiply the Denominators the one by

by the other, that is to say, 3 by 4, and therof commeth 12 for the denominator: so that the multiplication cõmeth to $\frac{6}{12}$, which being abreuied do make $\frac{1}{2}$: and so much amounteth the multiplication of the $\frac{2}{3}$ by $\frac{3}{4}$, as by practise appeareth.

6	1
$\frac{2}{3}$ · $\frac{3}{4}$	$\frac{6}{12}$
12	2

2 Likewise if you will multiply a broken number by whole number, or whole number by broken, which is al one as $\frac{4}{5}$ by 18, or else 18 by $\frac{4}{5}$, as set 1 vnder 18, thus $\frac{18}{1}$, and then multiply the numerator 18, by the numerator 4, and therof commeth 72. Likewise multiply the denominator 5, by the denominator 1, & thereof commeth 5, then diuide 72 by the denominator 5, and therof commeth $14\frac{2}{5}$ for ỹ whole multiplication. Or otherwise, abate frõ 18 his $\frac{1}{5}$ part, which is $3\frac{3}{5}$ & there remaineth $14\frac{2}{5}$, as herafter followeth

$$\frac{7}{1}\times\frac{2}{1}=\frac{14}{1}=5$$

$$2\ \ 72\ (14\tfrac{2}{5}\qquad 88$$

Or otherwise.

$$\frac{18}{1}\times\frac{1}{5}=\frac{18}{5}=5$$

$$3\ \ 18\ (3\tfrac{3}{5}\qquad 8$$

$$3\tfrac{3}{5}\times 4=14\tfrac{2}{5}$$

3 Also if you wil multiply a whole number, by whole number & broken, or else whole number and broken by a whole number, which is all one, as by exãple: if you wïll multiply 15 by $16\frac{3}{4}$, or else $16\frac{3}{4}$ by 15: First reduce $16\frac{3}{4}$ all into fourths, in multiplying 16 by the denominator of $\frac{3}{4}$ which is 4, and thereof commeth 64, wherunto adde the numerator 3, and it maketh $\frac{67}{4}$: which multiply by $\frac{15}{1}$ according to the instruction of the last example, and you shall find the product of this multiplication to be $251\frac{1}{4}$, as by practise in the next page following doth appeare.

67	1005	67	Z I
16 $\frac{3}{4}$	$\frac{67}{4}$ $\frac{15}{1}$	15	XØØ8 (251
	4	335	AAA
		67	$\frac{3}{4}$
		1005	

4. And if you will multiply a broken number, by whole number & broken, or else whole number and brokē by a broken. Example. If you will multiply $\frac{3}{4}$ by 18 $\frac{2}{3}$, or else 18 $\frac{2}{3}$ by $\frac{3}{4}$, which is all one: you must reduce the whole number into his broken by the first Reduction, and you shall find $\frac{56}{3}$, which you shall multiply by the $\frac{3}{4}$ after the doctrine of the first multiplication, that is to say: in multiplying the Numerator 56, by the Numerator of $\frac{3}{4}$, which is 3: and it is still 56, because 1 doth neither multiply nor diuide. And likewise you must multiply the denominator 3 by the denominator 4, and it maketh 12: then diuide 56 by 12, and thereof cōmeth 4 $\frac{2}{3}$. And so much amounteth the multiplication of the said 18 $\frac{2}{3}$ multi-

$\frac{2}{3}$ multiplyed by $\frac{1}{4}$, as by example.

	56	56	18	
18	$\frac{2}{3}$	$\frac{56}{3}$ $\frac{1}{4}$	56	(4 $\frac{2}{3}$
		12	12	

5 If you wil multiply whole number and broken, with whole and broken, you must first put either whole number into his broken, according to the instruction of the first reduction, and then multiply the one numerator by the other, and of the product make your numerator. And likewise multiply the denominators the one by ỹ other, & thereof make the denominator, then diuide the numerator by the denominator, and the quotient shall be the increase of this multiplicatiõ. Examp. If you would multiply 12 $\frac{4}{5}$, by 6 $\frac{3}{4}$: first by the first reduction the 12 $\frac{4}{5}$ will make $\frac{64}{5}$: and the 6 $\frac{3}{4}$ will make $\frac{27}{4}$, then multiply ỹ numerator 64, by the numerator 27, and thereof commeth 1728 for ỹ numerator. And then you must multiply the denominator

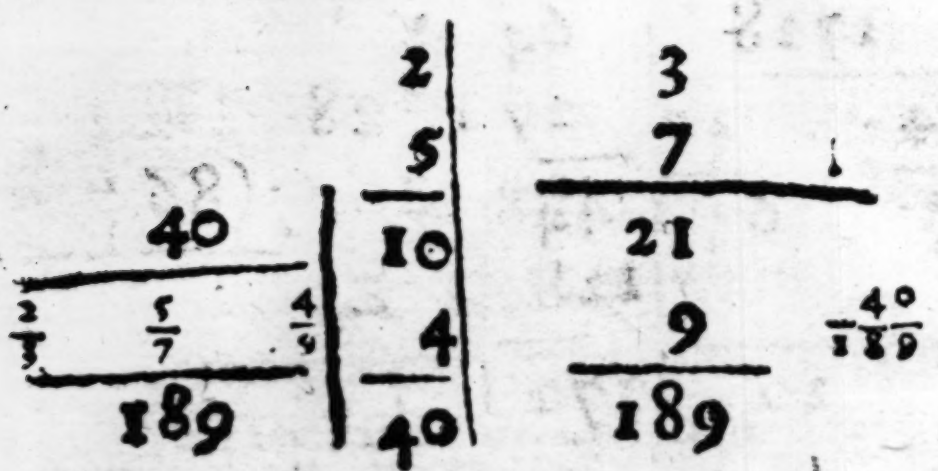
nator 5, by the denominator 4, & they do make 20: then diuide 1728, by 20, & therof commeth 86 $\frac{2}{5}$, for the whole multiplication, as by example.

1728		64	X
		27	1728
64	27		200 (86 $\frac{2}{5}$
12 $\frac{4}{5}$	6 $\frac{3}{4}$	448	
		128	2
20		172	

6 If you will multiply one broken number by many broken numbers thus: As to multiply $\frac{2}{3}$ by $\frac{5}{7}$ and by $\frac{4}{9}$, you must multiply the numerators of al the fractions, the one by the other, & of the procuct make the numerator, that is to say, 2 by 5, and they be 10, then 10 by 4, & they be 40 for the Numerator. Likewise you must multiply the denominators ỹ one by the other, that is to say, 3 by 7 maketh 21, then 21 by 9 maketh 189, for the denominator: then set 40 ouer ỹ 189 with a line betweene them, and they make $\frac{40}{189}$. And so much amounteth

the

the whole multiplicatiõ of the $\frac{2}{3}$ mul-tiplyed by $\frac{5}{7}$ and $\frac{4}{9}$ as by example fol-lowing. And thus is to be vnderſtood of all ſuch like.



Chap. 7.

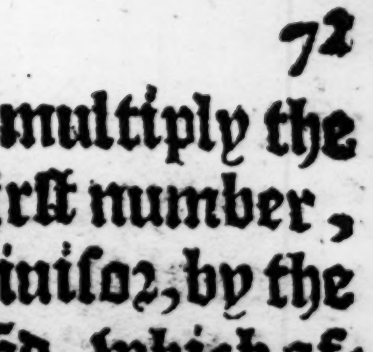
Of Diuiſion in broken numbers.

NOte that in diuiſiõ of bro-ken numbers, you muſt ſet you Diuiſor downe firſt, next vnto the left hand, and the diuidend or number which is to be diuided, alwaies to-ward the right hand. And then mul-tiply croſſe-wiſe, that is to ſay, the nu-merator of your diuiſor, by the deno-minator of the diuidend: and the pro-duct ſhall be the denominator, which afterward ſhall be your diuiſor.

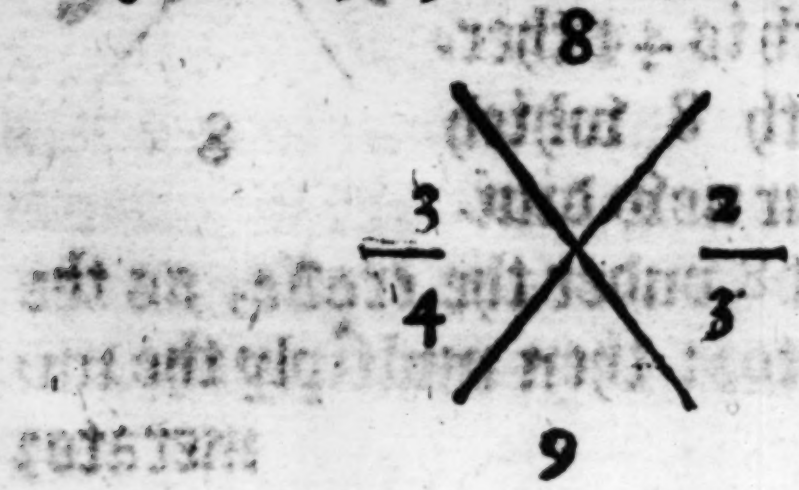
And

And likewiſe you muſt multiply the Denominator of your firſt number, that is to ſay, of your Diuiſor, by the Numerator of the diuidēd, which afterward ſhall bée the diuidend, and that muſt bee ſet ouer the croſſe, and the denominator vnder the croſſe, thē diuide the numerator by the denominator if it may be diuided, if not, you muſt abreuiate them, as héerafter by examples ſhall more plainly appeare.

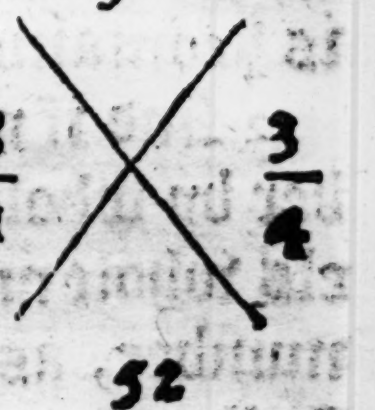
1. If you will diuide $\frac{3}{4}$ by $\frac{2}{3}$, you muſt ſet the diuiſor (which is $\frac{2}{3}$) next to the left hand, and the diuidend $\frac{3}{4}$ toward your right hand, with a croſſe betwéene them: as may appeare by this example in the margent. Then you ſhall multiply the Numerator of the $\frac{2}{3}$, which is 2 by the denominator of the $\frac{3}{4}$, which is 4 ther- of commeth 8 which ſhal be your new diuiſor: ſet that 8 vnder the croſſe, as the denominator: then multiply the numerator



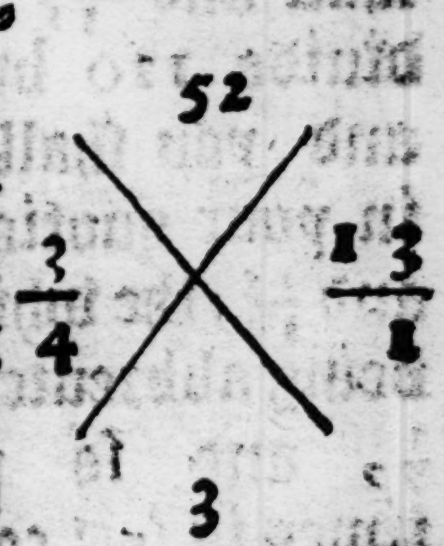
merator of the dividend, that is to say of the $\frac{3}{4}$ which is 3 by the denominator of the diuisor, that is to wit, of the $\frac{2}{3}$ which is 3, and therof commeth 9, set the 9 ouer the crosse of the numerator, which shall be now the dividend or number to be diuided. Then finally you shall diuide 9 by 8, & therof commeth into the quotient $1\frac{1}{8}$, & so oftentimes is $\frac{2}{3}$ cõtained in $\frac{3}{4}$, as doth appeare before in the margent. But in case you would diuide $\frac{2}{3}$ by $\frac{3}{4}$, you must likewise set your diuisor $\frac{3}{4}$ nert to your left hand, as is before sayd. And then proceed as is aboue declared, & you shall find that $\frac{2}{3}$ diuided by $\frac{3}{4}$ bringeth into the quotient $\frac{8}{9}$, which cannot bee diuided nor abbreuied. Wherefore it appeareth that $\frac{2}{3}$ being diuided by $\frac{1}{12}$, bringeth but $\frac{8}{9}$ of one vnity into the quotient, as appearth.



2 Likewiſe if you wil diuide a broken number by a whole number, or elſe a whole number by a broken, as to diuide $\frac{3}{4}$ by 13, you ſhall put 1 vnder 13, & it will be $\frac{13}{1}$ for your diuiſor, ſet that toward your left hand, and then multiply 13 by 4 according to the firſt diuiſion, and thereof will come 52, for the denominator, ſet ỹ vnder the croſſe: & multiply 3 by 1, maketh 3, for the numerator: ſet that ouer the croſſe, and it is $\frac{3}{52}$, as appeareth aboue.



But if you will diuide 13 by $\frac{3}{4}$, then ſet the $\frac{3}{4}$ next your left hand, and put one vnder 13, as in the laſt example & it is $\frac{13}{1}$, ſet that toward your right hand thus, as appeareth in the margent, and then worke according to the doctrine of the firſt Diuiſion, and



you ſhall find that 13 béeing diuided by $\frac{3}{4}$ bringeth into the quotient $\frac{52}{3}$ then diuide 52 by 3, and therof commeth 17 $\frac{1}{3}$, and ſo oftentimes is $\frac{3}{4}$ contained in 13, as doth appeare.

13 21 52 33 (17 $\frac{1}{3}$

3 And if you will diuide whole nũber by whole number and broken, or els whole number & broken by whole number, as to diuide 20 by $5\frac{5}{6}$, you ſhall reduce $5\frac{5}{6}$ into broken, by ye firſt reduction, and it maketh $\frac{35}{6}$ for your diuiſor, then put 1 vnder 20, & it will be $\frac{20}{1}$, then ſhall you multiply 35 by 1, and 20 by 6, as is taught in the other diuiſions, and you ſhall find $\frac{120}{35}$: then diuide 120 by 35, and you ſhall find in your quotient 3, and $\frac{15}{35}$, the which $\frac{15}{35}$ being abbreuied, is $\frac{3}{7}$, and ſo many times is $5\frac{5}{6}$ contai-

120

35 — 20

6 — 1

35

1

35

120 (3 $\frac{5}{7}$

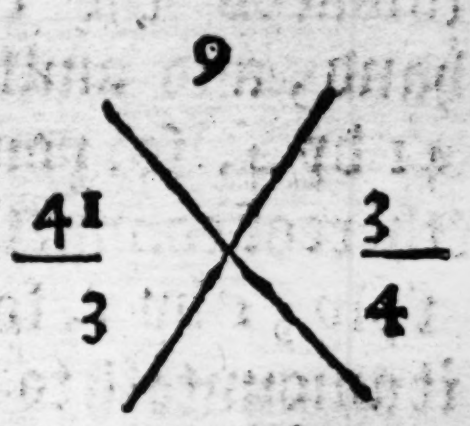
35

ned

ned in 20 as in ỹ margent appeareth.

But if you will diuide $5\frac{5}{6}$ by 20, you ſhall haue $\frac{35}{120}$, then you muſt diuide 35 by 120, which you cannot diuide, wherefore you ſhall abbreuiate $\frac{35}{120}$, and thereof commeth $\frac{7}{24}$ for your quotient.

4 If you will diuide a broke̅ number, by whole number and broken, or elſe whole nnmber and broken, by a broken number. As to diuide $\frac{3}{4}$ by $13\frac{2}{3}$, you muſt reduce $13\frac{2}{3}$ into his broken, by the firſt reduction, and they be $\frac{41}{3}$ for your diuiſor, then multiply 41 by 4, & they make 164 for your denominator, likewiſe multiply 3 by 3,



and they make 9 for the numerator, & then will your ſumme be $\frac{9}{164}$, as appeareth in the worke afore noted. But if you will diuide $13\frac{2}{3}$ by $\frac{3}{4}$, then you muſt diuide 164 by 9, and you ſhall

find $18\frac{2}{9}$.

5. If you will diuide whole number and broken, by whole number, & broken, as to diuide $7\frac{3}{4}$ by $13\frac{2}{3}$, you muſt reduce the whole numbers into their broken, by the doctrine of the firſt reduction, and you ſhall find $\frac{31}{4}$, for the $7\frac{3}{4}$, and $\frac{41}{3}$ for the $13\frac{2}{3}$: Then ſet downe $\frac{41}{3}$ toward the left hand, because it is your diuiſor, and the $\frac{31}{4}$ towards the right hand, and multiply 41 by 4, for you denominator: and thereof commeth 164. Likewiſe multiply 31 by 3, for your Numerator, & it amounteth to 93: the which diuiſi- will bee thus $\frac{93}{164}$ as before doth appeare.



But if you will diuide $13\frac{2}{3}$ by $7\frac{1}{4}$ you muſt (contrariwiſe to the other example) diuide 164, by 93: and you ſhall find in the quotient $1\frac{71}{93}$.

6. The broken numbers of broken,

muſt

muſt be diuided in ſuch manner as broken numbers are, & there is no difference, ſauing onely that of diuers and many broken numbers, you muſt make but two broken numbers, that is to ſay, the one for the diuiſor, & the other for the diuidẽd, or number that is to be diuided: example. If you will diuide the $\frac{3}{4}$ of $\frac{3}{7}$ of $\frac{1}{2}$, by the $\frac{2}{5}$ of $\frac{4}{7}$, you muſt vnderſtand, that for the firſt, the $\frac{3}{4}$ of $\frac{3}{7}$ of $\frac{1}{2}$, are $\frac{9}{40}$ by the 3 Reduction: and the $\frac{2}{5}$ of $\frac{4}{7}$, are by the ſame reduction $\frac{8}{21}$, then haue you $\frac{8}{21}$ for your diuiſor, & $\frac{9}{40}$ for your number to bée diuided, then multiply 8 by 40, which maketh 320, ſet that vnder ỹ croſſe, and multiply 9 by 21, and thereof commeth 189: which ſet ouer the croſſe for the numerator, and they make $\frac{189}{320}$ for his diuiſion, as doth appeare.



But if you would diuide $\frac{8}{21}$ by $\frac{9}{40}$, you muſt worke contrary to the laſt

example, that is to say, you must diuide 320, by 189: and thereof commeth in the quotient $1\frac{131}{189}$.

Chap. 8.

Treateth of Duplation, Triplation, *Quadruplation of all broken nũbers.*

IF you will double any broken number, you shall diuide the same by $\frac{1}{2}$: likewise if you will triple any fraction, you must diuide it by $\frac{1}{3}$. And for to quadruple any broken nũber, you shall diuide it by $\frac{1}{4}$, and so is to be vnderstood of all other.

Example of Duplation.

IF you wil double $\frac{3}{8}$ you shal diuide $\frac{3}{8}$ by $\frac{1}{2}$, and thereof commeth $\frac{6}{8}$, which being abbreuied, are $\frac{3}{4}$: as by example.



Or otherwise, in case the denominator of any fraction be an

euen

euen number, you may take halfe the said denominator, without any other operatiō, and the numerator to abide still the numerator, vnto ỹ said halfe of the denominator of the Fraction, as by ỹ other example before rehearsed, that is to say, of $\frac{3}{8}$, take $\frac{1}{2}$ of 8, which is 4: and that is the denominator, & 3 remaineth stil numerator to 4 and it maketh $\frac{3}{4}$ & so of all other. But in case the denominator bee an odde number, that is to say, not euen, then you may multiply the numerator by 2, or else double the numerator, which is al one thing, and that fraction shall be doubled. Example, if you will double $\frac{3}{5}$, you must onely multiply the numerator 3, by 2, and they be 6: which maketh that fraction to be $\frac{6}{5}$, ỹ which 6 being diuided by 5, bringeth $1\frac{1}{5}$ and so much is the double of $\frac{3}{5}$.

Example of Triplation.

If you will triple $\frac{3}{5}$, you must diuide $\frac{3}{5}$ by $\frac{1}{3}$, and thereof commeth $\frac{9}{5}$ which

being diuided bringeth $1\frac{4}{5}$, or otherwise, because the denominator is an odde number, you may multiply the numerator 3 by 3, & thereof commeth 9 which maketh $\frac{9}{5}$ as before appeared.

Example of Quadruplation.

If you will quadruple $\frac{4}{5}$ you shall diuide $\frac{4}{5}$ by $\frac{1}{4}$, and therof commeth $\frac{16}{5}$, which 16 being diuided by 5 bringeth $3\frac{1}{5}$, or otherwise, because the denominator of the fraction in an od nũber, you shall multiply the numerator of the $\frac{4}{5}$, that is to say, 4 by 4, and therof commeth 16: the which diuide by 5, and you shall find $3\frac{1}{5}$, as before. And this sufficeth for Duplation, Triplation, and Quadruplation.

Chap. 9.

Of the proofes of broken Numbers, *And first of Reduction.*

If you doe abbreuiate the broken numbers which bée reduced, you shall

shall returne them into their first estate: as by example, if you reduce $\frac{2}{3}$ with $\frac{4}{5}$, you shall find $\frac{10}{15}$ and $\frac{12}{15}$, then abbreuiate $\frac{10}{15}$, and you shall find $\frac{2}{3}$, abbreuiate likewise $\frac{12}{15}$, and therof commeth $\frac{4}{5}$ as before.

The proofe of Abbreuiation.

IF you doe multiply that number which you haue abbreuied, by that or those numbers, by the which you haue abbreuied them, you shal return them againe into their first estate. Example, if you wil abbreuiate $\frac{32}{48}$ by 16, in taking the $\frac{1}{16}$ part both of the numerator, and also of the denominator, you shal find $\frac{2}{3}$, the proofe is thus, you must multiply both the numerator & denominator of $\frac{2}{3}$, ý is to say, 3 by 16 maketh 48 for the denominator, & 2 by 16, maketh 32 for the numerator: then set the numerator 32, ouer the denominator 48, and they be $\frac{32}{48}$ as before.

The proofe of Addition.

If you do subtract one of the numbers, or many of them (which you haue added) from the totall summe, there shall remaine ỹ other, or others Example, if you do add $\frac{1}{3}$ with $\frac{1}{4}$, you shall find $\frac{7}{12}$. The prowfe is, if you subtract $\frac{1}{3}$ from $\frac{7}{12}$, you shall find remayning the other number, which is $\frac{1}{4}$, or else if you doe subtract $\frac{1}{4}$ from $\frac{7}{12}$ there will remaine the other number which is $\frac{1}{3}$.

The proofe of Substraction.

If you doe adde that number which remaineth, with the number which you did subtract, you shall find the totall summe, out of the which you made the abatement: or otherwise, if you adde the two lesser numbers together, you shall find the greater. Example: if you doe subtract $\frac{1}{4}$ from $\frac{2}{3}$, there will remaine $\frac{1}{12}$. The prowfe is thus; you must adde $\frac{1}{12}$ and $\frac{1}{4}$ together, and you shall find $\frac{16}{48}$, the which being abbreuied, doth make $\frac{1}{3}$ which

is

is the greateſt number.

The proofe of Multiplication.

If you diuide the product of the whole multiplycation, by ỹ multiplicator, you ſhall find in your quotient, the multiplicand or nũber the which you haue multiplied: or elſe if you diuide the totall ſumme which is come of the multiplicatiõ, by the multiplycand: you ſhall find in the quotient the multiplicator. Exam. If you multiply $\frac{2}{3}$ by $\frac{4}{5}$, the product of this multiplication will bée $\frac{8}{15}$. The proofe is thus: you ſhall diuide $\frac{8}{15}$ by the multiplicator $\frac{4}{5}$, and thereof commeth $\frac{2}{3}$, which is the multiplicand, or els diuide $\frac{8}{15}$ by $\frac{2}{3}$, and you ſhall find the $\frac{4}{5}$, which is the multiplicator.

The proofe of Diuiſion.

If you do multiply the quotient by the diuiſor, you ſhall find the number which you did diuide, that is to ſay,

your

your diuidend. Example, if you diuide $\frac{2}{3}$ by $\frac{3}{4}$ your quotient will be $\frac{8}{9}$, ỹ proofe is thus, you muſt multiply $\frac{8}{9}$ by $\frac{3}{4}$, and thereof commeth $\frac{24}{36}$, which being abreuied are $\frac{2}{3}$, which is your diuidend, and by this manner all whole numbers haue their proofes aſwel as broken numbers.

Chap. 10.

Of certaine queſtions done by brokē numbers. And firſt by Reduction.

FInd two numbers, wherof the $\frac{2}{7}$ of the one number, may be equall vnto the $\frac{3}{8}$ of the other. Anſw, You ſhall reduce $\frac{2}{7}$ and $\frac{3}{8}$ croſſe-wiſe, and you ſhall find 16 ouer the $\frac{2}{7}$, and 21, ouer the $\frac{3}{8}$, which are the two numbers that you ſeeke: for the $\frac{3}{8}$ of 16 are 6: and ſo are the $\frac{2}{7}$ of 21, likewiſe 6: wherefore you may perceiue that the $\frac{3}{8}$ of 16 which are 6, are equall vnto the $\frac{2}{7}$ of 21, which is alſo 6.

2. Find two numbers, wherof the $\frac{2}{3}$ of

$\frac{2}{3}$ of the one, may be double to the $\frac{1}{4}$ of the other. Anſwer. Double $\frac{1}{4}$, and you ſhall haue $\frac{2}{4}$, which being abbꝛeuied is $\frac{1}{2}$: then reduce $\frac{2}{3}$ and $\frac{1}{2}$ croſſewiſe, & you ſhall find 4 ouer the $\frac{2}{3}$, and 3 ouer the $\frac{1}{2}$, which are the 2 numbers that you ſéeke. Foꝛ the $\frac{2}{3}$ of 3, which is 2 is double vnto the $\frac{1}{4}$ of 4, which is but 1.

3. Find two numbers whereof the $\frac{1}{3}$ and the $\frac{1}{4}$ of the one, may bee equall vnto the $\frac{1}{4}$ & $\frac{1}{5}$ of the other. Anſwere. Adde the $\frac{1}{3}$ and $\frac{1}{4}$ together, and they make $\frac{7}{12}$, then ad $\frac{1}{4}$ and $\frac{1}{5}$ together, & they are $\frac{9}{20}$: then reduce $\frac{7}{12}$ and $\frac{9}{20}$ croſſewiſe, and you ſhall haue 140 ouer the $\frac{7}{12}$, & 108 ouer the $\frac{1}{20}$, which are the two numbers that you ſéeke. Foꝛ 63 which are the $\frac{7}{12}$ of 108, are alſo the $\frac{9}{20}$ of 140.

4. Find two numbers, wherof the $\frac{1}{2}$ the $\frac{1}{3}$ and the $\frac{1}{4}$ of the one of them, may be equall vnto the $\frac{1}{5}$ and $\frac{1}{6}$ and $\frac{1}{7}$, of the other number. Anſwere. Firſt you muſt adde $\frac{1}{2}$, $\frac{1}{3}$, & $\frac{1}{4}$ together, and they make $\frac{13}{12}$: then ad $\frac{1}{5}$, $\frac{1}{6}$, and $\frac{1}{7}$ together,

gether, and they make $\frac{1}{2}\frac{0}{1}\frac{7}{0}$. Then reduce $\frac{1}{1}\frac{3}{2}$ and $\frac{1}{2}\frac{0}{1}\frac{7}{0}$ crosse-wise, as by the first question of reduction, and you shall find 2730 ouer the $\frac{1}{1}\frac{3}{2}$, and 1284 ouer the $\frac{1}{2}\frac{0}{1}\frac{7}{0}$, which are the two numbers that you séeke: for 1391 which is the $\frac{1}{2}$ the $\frac{1}{3}$ the $\frac{1}{4}$ of 1284: is like to the $\frac{1}{5}$, $\frac{1}{6}$, and $\frac{1}{7}$ of 2730, which is also 1391.

5. Find thrée numbers, whereof the $\frac{2}{5}$ of the first, the $\frac{3}{7}$ of the second, & the $\frac{4}{9}$ of the third, may bee equall the one to the other. Answere. Set downe the $\frac{2}{5}$, $\frac{3}{7}$, and $\frac{4}{9}$, and then multiply the Denominator of the $\frac{2}{5}$, that is to say 5 by the Numerators of the other two Fractions, that is to say, by the numerator of $\frac{3}{7}$, and by the numerator of $\frac{4}{9}$, which is 3 and 4, and thereof commeth 60 for your first number: then shall you multiply the Denominator of the $\frac{3}{7}$, which is 7, by the numerators of $\frac{2}{5}$ and $\frac{4}{9}$, that is to say, by 2 and 4, and therof commeth 56, for the second number. Then multiply the denominator of $\frac{4}{9}$, that is to say, 9

by

by the numerator of $\frac{2}{5}$ and $\frac{3}{7}$, that is by 2 & 3, and thereof commeth 54, for the third number. And thus the $\frac{2}{5}$ of 60, which is 24, is likewise the $\frac{3}{7}$ of 56, which is the second number, and is also the $\frac{4}{9}$ of 54, which is the third number.

6. Find three numbers, of which the first & the second may be in such proportion as $\frac{1}{2}$ & $\frac{1}{3}$, and the second & third in such proportion as $\frac{1}{4}$ and $\frac{1}{5}$. Answere. reduce $\frac{1}{2}$ and $\frac{1}{3}$ crosse-wise, and you shall have 3 ouer the $\frac{1}{2}$, and 2 ouer the $\frac{1}{3}$, then reduce $\frac{1}{4}$ ond $\frac{1}{5}$ in like manner, and you shall find 5 ouer the $\frac{1}{4}$, and 4 ouer the $\frac{1}{5}$. Then say by the Rule of three, if 5 do giue me 4, what shall 2 giue me, which is the second proportionall, multiply the second number 4, by the third number 2, and thereof commeth 8, the which diuide by the first number 5, & therof commeth $1\frac{3}{5}$ for the third proportionall: and you shall find that 3, 2, $1\frac{3}{5}$, are the three numbers proportionall that I demand, or else 14, 10, and 8,

in

in whole numbers.

Queſtions done by Addition in *Fractions.*

WHat number is that, vnto the which if you adde 13 the whole amounteth to 31? Anſ. Subtract 13 from 31, & there wil remaine 18, which is the number you ſéeke.

2. What number is that, vnto the which if you adde $\frac{2}{7}$, the addition wil be $\frac{5}{6}$? Anſwere. Abate $\frac{2}{7}$ from $\frac{5}{6}$, and there will remaine $\frac{23}{42}$, which is the number that you deſire.

3. What number is that, whervnto if you add $7\frac{2}{3}$, the whole addition will be $12\frac{1}{4}$? Anſwe. Abate $7\frac{2}{3}$ from $12\frac{1}{4}$, and the remaine will be $4\frac{7}{12}$, which is the number that you deſire to know.

4. What number is that wherunto if you adde the $\frac{1}{4}$ of it ſelfe, that is to ſay, of the number that you ſéeke, the whole addition may be $\frac{5}{6}$? Anſw. Héere followeth a generall rule for

all

all such like questions. First of 3, which is the numerator of $\frac{3}{4}$ make ỹ still the numerator: and likewise of 3 and 4 added together, which is both ỹ numerator, and the denominator, of ỹ $\frac{3}{4}$, make them your denominator: so you shall find $\frac{3}{7}$: then take the $\frac{3}{7}$ of $\frac{5}{6}$ which is $\frac{15}{42}$ or $\frac{5}{14}$, and subtract them from $\frac{5}{6}$, & there wil remain $\frac{10}{21}$, which is the number that you séeke.

5. What number is that, vnto the which if you adde his owne $\frac{2}{3}$, that is to say $\frac{2}{3}$ of it selfe, the whole addition shall be 20? Answ. Doe as in the last question, of the numerator of $\frac{2}{3}$, that is to say, of 2, make still your numerator: & likewise of the numerator 2 and the denominator 3 of the $\frac{2}{3}$ make of them both, your denominator: and you shall find $\frac{2}{5}$, then take the $\frac{2}{5}$ of 20 which are 8, & abate them from 20, & there will remaine 12: which is the number that you desire. And so it is to be done of all such like reasons.

Questions done by Sustraction in Fractions.

WHat number is that, from the which if you do abate 17, the rest may be 19? Ans. Adde 17, and 19 together, & you shall find 37, which is the number that you séeke.

2 What number is that, from the which if you abate $\frac{3}{5}$, the rest may bée $\frac{1}{3}$? Ans. Adde $\frac{3}{5}$ and $\frac{1}{8}$ together, and you shall find $\frac{29}{40}$, which is the number that you demaund.

3 What number is that, from the which if you reduct $13\frac{1}{2}$ the rest may be $5\frac{5}{7}$? Answ. Adde $13\frac{1}{2}$ and $5\frac{5}{7}$ together, and thereof commeth $19\frac{3}{14}$, which is the number that you séeke.

4 What number is that, from the which if you substract his $\frac{2}{5}$, that is to say $\frac{2}{5}$ of it selfe, the rest may be 12? Answer. And a rule for such like reasons: that is to say, from the denominator of $\frac{2}{5}$ which is 5 abate 2 which is his numerator, & there resteth 5 for the denominator, and thus of $\frac{2}{5}$ you haue now made $\frac{2}{3}$, then take the $\frac{2}{3}$ of

12 which are 8, and adde them vnto 12, and thereof commeth 20, for the number which you desire.

5 What number is that, from the which if you doe abate his $\frac{3}{4}$, the rest may be $\frac{8}{9}$? Answer. From the denominator of $\frac{3}{4}$, which is 4, substract his numerator 3 and there resteth 1, thus of $\frac{3}{4}$ you haue made $\frac{3}{1}$. Then multiply $\frac{3}{1}$ by $\frac{8}{9}$, and thereof commeth $2\frac{2}{9}$, the which adde vnto $\frac{8}{9}$, and you shall haue $3\frac{5}{9}$, which is the number that you seeke.

6 What number is that, from the which if you abate his $\frac{4}{5}$, the rest may be $12\frac{2}{3}$? Answere. Do as you did in the last question, and you shall find that the $\frac{4}{5}$ wilbe $\frac{4}{1}$: And therefore multiply $12\frac{2}{3}$ by $\frac{4}{1}$, and thereof commeth $50\frac{2}{3}$, the which add vnto $12\frac{2}{3}$, and you shall find $63\frac{1}{3}$, for the number that you demaund. And thus of all such like Questions.

Questions of Multiplication in Fractions.

WHat number is that, which being multiplyed by 13, the whole product of that multiplication shall make 221? Anſ. Diuide 221 by 13, and therof commeth 17, which is the number that you ſéeke.

2 What number is that which being multiplyed by 15 ỹ whole multiplicatiõ will amount to $\frac{3}{4}$? Anſwere. Diuide $\frac{3}{4}$ by $\frac{15}{1}$, and thereof commeth $\frac{1}{20}$, which is the nũmber that you ſéek.

3 What number is that, which being multiplyed by 21, the whole multiplication will be $16\frac{4}{5}$? Anſw. Diuide $16\frac{4}{5}$ by $\frac{21}{1}$, and you ſhall find $\frac{4}{5}$, & that is the number that you demand.

4 What number is that, which being multiplyed by $\frac{3}{4}$, the multiplication will amount to 18? Anſw. Diuide $\frac{18}{1}$ by $\frac{3}{4}$, and thereof commeth 24 which is the number that you deſire to know.

5 What number is that, which if

it

it be multiplyed by $\frac{2}{3}$, the whole multiplication will be $\frac{1}{4}$? Anſ. Diuide $\frac{1}{4}$ by $\frac{1}{3}$, & the quotient will be $\frac{3}{8}$ which is the number that you require to know.

6 What number is that, which being multiplyed by $\frac{5}{8}$, the product of ỹ multiplication will bee $16\frac{2}{3}$? Anſwere. Diuide $16\frac{2}{3}$ by $\frac{2}{8}$, and thereof commeth $26\frac{2}{3}$, which is the number that you ſeeke.

Heere enſueth other neceſſarie queſtions, which are wrought by Multiplicaoion *in broken numbers.*

I Demaund how much the $\frac{5}{8}$ of 20 ſhil. are worth, or what are the $\frac{5}{8}$ of 20 ſhillings? Anſw. You muſt multiply $\frac{5}{8}$ by $\frac{20}{1}$, and the product will be $\frac{20^{0}}{8}$, therfore diuide 100 by 8, and therof commeth $12\frac{2}{2}$, which is to ſay, 12 s. 6 d. and ſo much are the $\frac{5}{8}$ of 20 ſhillings worth.

2 I demaund what the $\frac{3}{4}$ of $\frac{5}{6}$ of a pound of money are worth? That is

to say of 20 s. Answ. Multiply $\frac{3}{4}$ by $\frac{5}{6}$, and thereof commeth $\frac{5}{8}$: Then take the $\frac{5}{8}$ of 20 shillinges, as in the last Question going before, and you shall find 12 s. 6 pence, and so much are $\frac{3}{4}$ of $\frac{5}{6}$ of 20 s. worth.

3 I demaund what the $\frac{2}{3}$ of 8 d. $\frac{1}{2}$ are worth? Answe. Multiply 8 $\frac{1}{2}$ by $\frac{2}{3}$ or else $\frac{2}{3}$ by 8 $\frac{1}{2}$, which is all one, and you shall find $\frac{34}{6}$. Then diuide 34 by 6, and your Quotient will bee 5 pence $\frac{4}{6}$, and so much are the $\frac{2}{3}$ of 8 d. $\frac{1}{2}$ worth.

4 What are the $\frac{3}{4}$ of 14 pence $\frac{3}{5}$? Answere. Multiply 14 $\frac{3}{5}$ by $\frac{3}{4}$, and thereof commeth $\frac{21}{2}\frac{9}{0}$: Therefore diuide 219 by 20, and your Quotient will bée 10 pence, $\frac{19}{20}$: and so much are the $\frac{3}{4}$ of 14 $\frac{3}{5}$.

5 How many quarters or fourth parts are contained in 7 $\frac{2}{3}$? Answer. Multiply 7 $\frac{2}{3}$ by $\frac{4}{1}$ (because one whole containeth 4 quarters) and thereof commeth 30 $\frac{2}{3}$, and so many quarters are in the 7 $\frac{2}{3}$, that is to say, 30 quarters and $\frac{2}{3}$ of a quarter.

6 How

6 Yow many thirds are in $\frac{3}{4}$ and $\frac{1}{2}$, that is to say, in 3 quarters, and $\frac{1}{2}$ of one quarter? which are $\frac{7}{8}$ by the fift reduction. Answere. multiply $\frac{7}{8}$ by $\frac{3}{1}$ (for because that in 1 whole are contained 3 thirds) and thereof commeth $2\frac{5}{8}$, the which $2\frac{5}{8}$ do signifie $\frac{2}{3}$, and $\frac{5}{24}$ of a third: and so many thirds are in $\frac{3}{4}$ and $\frac{1}{2}$ or in $\frac{7}{8}$, which is all one.

Questions done by Diuision in *broken numbers*.

1. What number is that, which being diuided by 17, the quotient wil be 13? Answ. Multiply 17 by 13, and thereof commeth 221, which is the number that you seeke.

2. What number is that, which being diuided by $\frac{3}{4}$, the quotient wil be 21? Answere. Multiply $\frac{21}{1}$ by $\frac{3}{4}$, & thereof commeth $\frac{63}{4}$: Then diuide 63 by 4, & thereof cõmeth $15\frac{3}{4}$: which is the number that you seeke.

3. What number is that, which being diuided by $\frac{1}{8}$, the quotient will

be $\frac{2}{3}$? Anſwere. Multiply $\frac{2}{3}$ by $\frac{1}{8}$, and therof coumeth $\frac{2}{24}$: which being abbreuïed are $\frac{1}{12}$, for the number which you require.

4. What number is that, which being diuided by $\frac{4}{5}$, the quotient will be $16\frac{2}{3}$? Anſwe. Multiply $16\frac{2}{3}$ by $\frac{4}{5}$, and therof commeth $\frac{20}{15}$. Therefore diuide 200 by 15, & thereof commeth $13\frac{1}{3}$, which is the number that you deſire to find.

5 What number is that, which being diuided by $13\frac{2}{3}$, the quotient will be 20? Anſwe. Multiply $\frac{20}{1}$ by $13\frac{2}{3}$, and thereof commeth $\frac{80}{3}$, then diuide 800 by 3 and therof commeth $266\frac{2}{3}$: for the number which you ſeeke.

6. What number is that, which if it be diuided by $12\frac{1}{2}$ the quotient wil be $\frac{7}{8}$? Anſ. Multiply $12\frac{1}{2}$ by $\frac{7}{8}$, and therof commeth $\frac{175}{16}$: then diuide 175 by 16, and therof commeth $10\frac{15}{16}$: for the number which you deſire.

Other

Other necessary questions done by *Diuision in broken numbers.*

I Demand what part 30 is of 70? Answere. diuide 30 by 70, which you cãnot, for they are $\frac{30}{70}$, but abreuy thẽ, & they are $\frac{3}{7}$: thus 30 are ỹ $\frac{3}{7}$ of 70

2 I demaund what part 10 is of $16\frac{2}{3}$? Ans. Diuide $\frac{10}{1}$ by $16\frac{2}{3}$, and thereof commeth $\frac{30}{5}$, which being abbreuied are $\frac{3}{5}$. And thus 10 is found to be $\frac{3}{5}$ of $16\frac{2}{3}$.

3. Yoze $\frac{5}{8}$ of one vnity, what part are they of 25? Answer. Diuide $\frac{5}{1}$ by $\frac{25}{1}$, and thereof commeth $\frac{5}{200}$, which being abbreuied is $\frac{1}{40}$, and thus $\frac{5}{8}$ of 1, is but the $\frac{1}{40}$ of 25.

4 Yoze, $\frac{5}{6}$ what part are they of $\frac{7}{8}$? Answer. Diuide $\frac{5}{6}$ by $\frac{7}{8}$, and you shall find $\frac{40}{42}$ which abbreuied are $\frac{20}{21}$.

5 Yoze $\frac{4}{5}$ of 1, what part are they af $13\frac{1}{3}$? Ans. Diuide $\frac{4}{5}$ by $13\frac{1}{3}$, and you shal find $\frac{12}{200}$, which being abbreuied are $\frac{3}{50}$. And thus $\frac{4}{5}$ of 1, are the $\frac{3}{50}$ of $13\frac{1}{3}$.

6 Yoze $12\frac{1}{2}$ what part are they of

30?

30? Anſw. Diuide $12\frac{1}{2}$ by $\frac{30}{1}$, and you ſhall find $\frac{250}{60}$, which being abbreuied are $\frac{5}{12}$ and thus $12\frac{1}{2}$, are the $\frac{5}{12}$ of 30.

7 More, $16\frac{2}{3}$ what part are they of $57\frac{1}{7}$? Anſw. Diuide $16\frac{2}{3}$ by $57\frac{1}{7}$, & thereof commeth $\frac{350}{1200}$ which being abbreuied are $\frac{7}{24}$: and thus $16\frac{2}{3}$ are the $\frac{7}{24}$ of $57\frac{1}{7}$.

8 More $\frac{3}{4}$ and $\frac{2}{3}$ of $\frac{1}{4}$, or 3 quarters and $\frac{2}{3}$ of one quarter, what part are they of 1? Anſwe. reduce $\frac{3}{4}$ and the $\frac{2}{3}$ of $\frac{1}{4}$ into one broken number by the 5 reduction, and you ſhall find $\frac{11}{12}$. And thus the $\frac{3}{4}$, and $\frac{2}{3}$ of $\frac{1}{4}$, are the $\frac{11}{12}$ of 1 whole.

9 More, of what number are 9 the $\frac{2}{3}$? Anſw. Diuide 9 by $\frac{2}{3}$, & thereof commeth $13\frac{1}{2}$: which is the number whereof 9 are the $\frac{2}{3}$.

10 More of what number are $\frac{2}{5}$ the $\frac{3}{4}$? Anſw. Diuide $\frac{2}{5}$ by $\frac{3}{4}$, and thereof commeth $\frac{8}{15}$: which is the number whereof $\frac{2}{5}$ are the $\frac{3}{4}$ of the ſame number.

11 More

11 Moze, of what number are $5\frac{3}{4}$, the $\frac{3}{7}$? Anſwere. Diuide $5\frac{3}{4}$ by $\frac{3}{7}$, and you ſhall find $13\frac{5}{12}$, which is the number wherof $5\frac{3}{4}$ are the $\frac{3}{7}$.

12 Moze, $9\frac{2}{3}$, what part are they of $33\frac{1}{2}$? Anſwere. Diuide $9\frac{2}{3}$ by $33\frac{1}{2}$, and therof commeth $\frac{58}{201}$: and thus $9\frac{2}{3}$ are the $\frac{58}{201}$ of $33\frac{1}{2}$ as appeareth.

The

The Third part treateth of certaine briefe Rules, called Rules of Practise, with diuers necessary questions : profitable not *onely for Marchants, but also for all other Occupiers.*

Chap. 1.

SOme there be, which do cal these Rules of practise, briefe Rules: for that by them, many questions may be done with quicker expedition, than by the rule of Thrée. There be others which call them the small multiplication, for because that the product is alwaies lesse in quantity, than the number which is to bée multiplied. This practise commeth not in vse, but onely among small kinds of numbers, which haue ouer them other numbers that are greater. And this bëeing well considered, is no o-

ther

ther thing but to conuert lesser, and particular kindes of number, into greater: the which may be done by ỹ meanes of diuisiõ, in taking ỹ halfe, the third, the fourth, the fift, or such other parts of the summe, which is to be multiplyed, as the multiplier is part of his greater kinde, and that which commeth thereof, is worth as much (not in quantity, but in his owne forme and quality) as if you did multiply simply the two summs, the one by the other. And for ỹ better understanding of such conuersions, you must haue respect to one of these two considerations: the first is, when one would demaund this question, At 6 d. the yard of Cotton, what are 18 yards worth by the price? It is manifest ỹ they are worth 18 péces of 6 pence the péce, or 18 halfe shillings, which must bee turned into shillings, in taking the halfe of 18 s̄. and they make 9 s̄: Or otherwise you must consider that at 1 s̄. the yard, the 18 yards are worth 18 s̄. Therefore

at

at 6 s. they shal be but halfe so much, for 6 d. is but the $\frac{1}{2}$ of 1 s. Therfore you must take the $\frac{1}{2}$ of 18 s. and they make 9 s. which are worth as much as 108 d. that is to say, as 18 times 6 pence.

Rule. First, if you will multiply any nũber after this maner by pence, whereof the number of the same pence doe not extend vnto 12, and thereof to bring shillings into the product: you must know the aliquot parts of 12, which are these: that is to say, 6, 4, 3, 2, and 1. For 6 is the $\frac{1}{2}$ of 12, and 4 is the $\frac{1}{3}$ of 12, 3 is the $\frac{1}{4}$, 2 is the $\frac{1}{6}$, and 1 is $\frac{1}{12}$. Then for 6 d. which is ỹ halfe of 1 shilling, you must take the $\frac{1}{2}$ of all the number which is to be multiplyed: And that which commeth thereof shal be shillings: if there do remaine 1, it is 6 pence.

An aliquot part is an eue *part of a shilling or of a poũd or of any other thing, as* $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$, *&c. are called aliquot parts.*

For foure pence, you must take the $\frac{1}{3}$ of all the number that is to be multiplyed: and if any vnities doe remain, they shal be thirds of a shilling euery one being in value 4 d.

For

For 3 pence you must take the $\frac{1}{4}$ of al the sum: if any vnities do remaine they shall be fourths of a shilling, euery one being worth 3 pence.

For 2 pence you must take the $\frac{1}{6}$ of all the summe, and if any vnities doe remaine, they shall bée sixe parts of a shilling, béeing euery one of them worth 2 pence.

For 1 d. take the $\frac{1}{12}$ of the whole sum, if any vnities doe remaine, they are the twelfth parts of a shilling each of them being in value 1 d. as by these examples following doth plainly appeare.

Example. j.

At 6 Pence the yard.
What are 59 yardes worth?

29 shil. 6. Pence.

ij.

At 4 Pence the yard.
What are 82 yardes?

27 shil. 4. Pence.

iij.

At 3 Pence the yard.
What 97 yardes?

---

24 shil. 3. Pence.

iiij.

At 2 Pence the yard.
What 346 yardes?

---

57 shil. 8. Pence.

v.

At 1 Penie the yard.
What 343. yardes?

---

28 shil. 7 Pence.

Yéere you may sée in the first example, that 59 yardes, at 6 pence the yard, are worth 29 shillings 6 pence, in taking the $\frac{1}{2}$ of 59. And in the second example, the 82 yardes at 4 d. the yard, are worth 27 s. 4 d. in taking the $\frac{1}{3}$ of 82.

Like-

Likewise, in the third example 97 yardes, at 3 pence the yard bringeth 24 shillings 3 pence, in taking the $\frac{1}{4}$ of 97. Also in the fourth example 346 yards, at 2 pence the yard, maketh 57 shillings 8 pence, in taking the $\frac{1}{6}$ of 346. And finally in the fift example: 343 yardes, at 1 d. the yard, amount to 28 shil. 7 d. in taking the $\frac{1}{12}$ of 343. And so is to be done of all such like, when the nũber of the pence is any of the aliquot parts of 12.

But if the number of the pence be not an aliquot part of 12: you must reduce them into some aliquot parts of 12: and after the aforesaid maner, you shall make of them two or three products as néed shall require, and adde them together into one summe, as 5 d. may be reduced into 4 d. & 1 d. or else into 3. and 2 d. For 4 d. & 1 d. do make 5 d. & so do 3 d. & 2 d. the like. Wherefore if you will worke by 4, & by 1: you must for 4 d. take first the $\frac{1}{3}$, of the number that is to bee multiplied, and for 1 d. take the $\frac{1}{12}$ of whole *Rule. 2.*

summe or rather for 1 d. yée may take the $\frac{1}{4}$ of the product which did come of the 4 d. because that 1 d. is the $\frac{1}{4}$ of 4 pence. But if you will worke by 3 d. and 2 pence, you shal take for 3 d. the $\frac{1}{4}$ of the number which is to be multiplyed: and likewise for 2 pence the $\frac{1}{6}$ of the same number, adding together both the products: The totall Sum of those two numbers shall bée the solution to the question. And in like manner is to be done of all others.

As by these examples following may appeare.

Example.

j.

At 5 Pence the yarde.
What will 49 yards amount vnto?

16 shil. 4 pence.
4 shil. 1 d.

20 shil. 5 d.

ij.

At 7 d. the lib.
What will 54 lib. cost?

18 *shil.* 0 *d.*
13 *shil.* 6 *d.*

31 *shil.* 6 *d.*

iij.

At 8 Pence the peece.
What are 40 worth?

13 *shil.* 4 *d.*
13 *shil.* 4 *d.*

26 *shil.* 8 *d.*

Other waies,

What are 40 peeces worth?
At 8 d. the peece.

20. *shil.*
6 *shil.* 8 *d.*

26 *shil.* 8 *d.*

iiij.

At 9 Pence the yard.
What are 37 yardes?

36 *shil.* 6 *d.*
18 *shil.* 3 *d.*
54 *shil.* 9 *d.*

v.

At 10 d. the elle.
What are 32 elles?

16 *shil.* 0.
10 *shil.* 8.
26 *shil.* 8 *d.*

vj.

At 11 d. the lib.
What are 27 lib?

9 *shil.* 0.
9 *shil.* 0.
6 *shil.* 9.
24 *shil.* 9 *d.*

Here in this first example, where it is demanded (at 5 pence the yarde) what will 49 yardes amount vnto? First for 4 pence, I take the $\frac{1}{2}$ of 49 s and thereof commeth 16 s. 4 d. then for 1 d. I take the $\frac{1}{4}$ of the same product, that is to say, of 16 s. 4 d. and that bringeth 4 s. 1 d. these 2 Sums added together doe make 20 s. 5 d. And so much are the 49 yardes worth at 5. the yarde.

For 7 d. take the $\frac{1}{3}$ and the $\frac{1}{4}$ of the whole sum which is to be multiplied, and ad them together, that is to say, for 4 d. you must take $\frac{1}{3}$: and for 3 d. the $\frac{1}{4}$: because 4 d. is the $\frac{1}{3}$ of 12 d. & 3 d. is the $\frac{1}{4}$, as in the second example before doth appeare, where ỹ question is thus, at 7 d the ri. what will 54 ri. cost? First for 4 d. I take ỹ $\frac{1}{3}$ of 54 & they make 18 s. Likewisy for 3 d. I take $\frac{1}{4}$ of 54, and they are 13 s 6 d. Then I ad 18 s. and 13 s. 6 d. together, so both amount to 31 s. 6 d. and so much are the 54 ri. at 7 d. the ri.

Otherwise, for 7 d. you shall take

firſt the $\frac{1}{2}$ of the whole ſumme for 6 d. Then for 1 d. you muſt take ye $\frac{1}{6}$ of the ſame product, and add them together, ſo you ſhall haue the like Summe as before.

For 8 pence, you muſt firſt take $\frac{1}{3}$ of the whole ſumme for 4 pence: and another $\frac{1}{3}$ for other 4 d. and adde them together, as in this example doth euidently appeare. Where the queſtion is thus, at 8 d. the péece, what are 40 péeces worth? Firſt for 4 d. I take the $\frac{1}{3}$ of 40 which is 13 s. 4 d: Againe, I take another $\frac{1}{3}$ for the other 4 pence which is alſo 13 s. & 4 pence. Theſe two ſumms being added together, do make 29 ſhillings, 8 pence, and ſo much are the 40 péeces worth, at 8 d. the péece: as in the third example aboue ſaid doth appeare.

Otherwiſe for 8 pence, you may take firſt the $\frac{1}{2}$ of the whole ſumme for 6 d. Thē for 2 d. you ſhall take the $\frac{1}{3}$ of the product, which did come of ye ſaid $\frac{1}{3}$ and adde them together: ſo ſhall yon haue likewiſe the ſolution to the queſtion.

question. As in the same third example of 40 yardes: I take first the $\frac{1}{2}$ of 40 for 6 d. and therof commeth 20 s. then for 2 d, I take $\frac{1}{3}$ of the said product, that is to say of 20 s. which bringeth 6 s. 8 d. these two summes (20 s. and 6 s. 8 d:) I adde together, & they make 26 s. 8 d. as before.

For 9 d. you must take the $\frac{1}{2}$, & the $\frac{1}{4}$ of the whole summe, and adde them together: or else for 6 d. take first $\frac{1}{2}$ of the whole summe, then for 3 d. take ye $\frac{1}{2}$ of the same product, because 3 d. is ye halfe of 6 d. And 6 d. added with 3 d. bringeth 9 d. as by the fourth examp. where it is demanded after this sort, at 9 d. the yard, what are 73 yardes worth: First for 6 d. I take the $\frac{1}{2}$ of 73: and thereof commeth 36 s, 6 d. then for 3 d. I take $\frac{1}{2}$ of the same 36 s. 6 d. which is 18 shil. 3 d. these two summes I adde together, and they make 54 s. 9 d. as in the said fourth example is euident.

For 10 d. take first the $\frac{1}{2}$ then the $\frac{1}{3}$ of the whole summe: and adde them

together and it is done.

For 11 d. take first $\frac{1}{3}$ for 4 d. secondly, another $\frac{1}{3}$ for other 4 d. and thirdly $\frac{1}{4}$ for 3 d. (of all the whole summe) & adde them together, and that answereth the question.

Or else for 11 d. take first the $\frac{1}{2}$ for 6 d. Then the $\frac{1}{3}$ of the whole sum for 4 d. and finally the $\frac{1}{4}$ of the last product for 1 d. adding them together, and it will be like to the other.

Rule 3. Likewise by the same reason, when you will multiply (by shillings) any number that is vnder 20 s̄. you shall haue in the product Pounds, if you know the aliquot parts of 20, which are these: 10, 5, 4, 2, and 1. For 10 is the $\frac{1}{2}$ of 20, 5 is the $\frac{1}{4}$ part, 4 is the $\frac{1}{5}$, 2 is the $\frac{1}{10}$, and 1 is the $\frac{1}{20}$.

Then for 10 s̄. which is the $\frac{1}{2}$ of a pound, you must take the $\frac{1}{2}$ of that nũber which is to be multiplyed, & you shall haue pounds in the product. If there do remaine 1, it shall be worth 10 shillings.

For

For 5 shillings, you must take the $\frac{1}{4}$ of the number which is to bée multiplyed, and if there doe remaine any vnities, they shall be fourth parts of a pound, euery vnity being in value 5 shillings.

For 4 s. you must take the $\frac{1}{5}$ of the number which is to bée multiplyed: And if there do remaine any vnities, they shall be fift parts of a pound, euery vnity being worth 4 shillings.

Example.

At 10 shillings the peece.
What are 75 peeces worth?

37 *lib.* 10 *shil.*

At 5 shil. the yard.
What are 89. yardes worth?

22 *lib.* 5 *shil.*

At 4 shil. the elle.
What are 93 elles worth?

18 *lib.* 12 *shil.*

For

For 2 shillings, you must take the $\frac{1}{10}$ of the number that is to be multiplyed. Wherefore if you will take ỹ $\frac{1}{10}$ of any number: you must separate the last figure of the same number, (which is nèerest your right hand) from all ỹ other figures, with a small strike or dash with a pen. For all the other figures which doe remaine towards your left hand from the same figure that you doe separate, shall bée the said $\frac{1}{10}$ of a pound: € that figure so separated toward your right hand, shall be so many pèeces of 2 shillings the pèece, the which figure must bée doubled to make thereof shillings, as by these examples appeareth.

At 2 shil. the lib.
What are 9|8 lib. worth?

9 lib. 16 shil.

At 2 shil. the dozen.
What are 40|3 dozens worth?

40 lib. 6 shil.

Hèere

Héereupon dependeth another exact way for to multiply by shillings (if the number of shillinges bée euen) which is thus: you shall take ½ the nũber of the same shillings, and conuert them into péeces of 2 shillings. Then by the number of this halfe, you must first multiply the last figure (toward you right hand) of the nũber which is to be multiplied. And if there be any tennes in the same product, those must you reserue in your mind: But if (with the same, or else without the same) you doe find any diget number ỹ same diget nũber shall you double, and put it into the place of shil. Then must you procéed to the multiplicatiõ of ỹ other figures, adding vnto ỹ product, the tens which you before reserued: and thereof shall come pounds. *Rule. 4.*

Now for your better vnderstãding of this which hath béen said, and by ỹ way of exãple, I will propone vnto you this question.

At 8 shillings the grosse, what are 97 grosse worth after the rate?

First

First in this exãple I take halfe the nũber of shillings, as before is taught that is to say, of 8 shillings which is 4 shillings: this 4 shillings I put apart behind a crooked line, right against 97 towards the left hand, as héere you may sée, & as héereafter appeareth by diuers examples.

At 8 shil. the grosse.

4) *What will* 9|7 *grosse cost?*

38 *lib.* 16 *shil.*

At 6 shil. the yarde.

3) *What* 9|9?

29 *lib.* 14 *shil.*

At 12 *shil.*

6) *What* 34|5?

207 *lib.* 0 *shil.*

At 14 *shil.*

7) *What* 21|0?

147 *lib.* 0 *shil.*

Now

Now in ỹ firſt example, where it is demanded at 8 s̄. the groſſe, what are 97 groſſe: Firſt the ½ of 8s. which is 4 s. being ſet apart behind the croked line, as before is ſaid: then I multiply the 97 by 4, ſaying firſt, 4 times 7, is 28. I double the diget number 8, and that maketh 16, the which 16, I do put vnder the line, in the place of ſhillings, and I kéepe the 2 tennes in my mind, which héere in worke doe repreſent 2 li. Then ſecondly I multiply 9 by the ſaid 4, and therof commeth 36 whereunto I adde the 2 li. which before I did reſerue, and they make 38. Therefore I put 38, vnder the line in the place of pounds, and the whole ſumme will be 38 li. 16 s̄. Thus much are the 97 groſſe worth, at 8 ſhillings the groſſe: the like is to be done of all other. As of 12 ſhil. in multiplying by 6. Likewiſe of 6 ſhil. if you multiply by 3: alſo of 14, if you multiply by 7. And ſo of al euen numbers after the ſame manner.

For 1 ſhilling you muſt take the ½

of

of the $\frac{1}{10}$ part of any number that is to be multiplied.

And if any thinge doth remaine they are shil. Thus by this manner shil. are conuerted into pounds: for it is euen like as though you did diuide thē by 20 s. as by this example in the margēt doth appeare. Where it is demanded at 1 s. ỹ yard, the péece or any other thing, what are 350 yards or péeces worth.

At 1 shil.
What 350.
17. lib. 10 shil.

First I seperate ỹ last figure of 350 next to my right hand, which is the 0, with a line betwéene it and the figure 5. Then I make a line vnder ỹ 35|0, and I take ỹ $\frac{1}{2}$ of 35, after this manner: saying the $\frac{1}{2}$ of 3 is 1, & 1 remaineth, which remaine signifieth 10, in that second place: Then I put 1 vnder the line against 3, and I proceed to the rest, saying the halfe of 15 is 7, (the which 15 came of the 1 that remained, & of the 5 in ỹ first place.) I put 7 vnder the line, right against 5, and

5, and they make 17 li. The 1 which did last remaine, is 10 s. Now I put 10 s. apart vnder the line, and the whole summe is 17 li. 10 s. so much are 350 worth at 1 s. the péece.

But when the number of shillings is not some aliquot part of 20 s. you must then conuert the same number of shillings, into the aliquot parts of 20, and make two or thrée products as néed shal require, the which must be added thgether after this manner following.

For 3 shillings, you must first take for 2 s. the $\frac{1}{10}$ of the number that is to be multiplyed, then for 1 shilling, you must take the $\frac{1}{2}$ of the product which did come of the same $\frac{1}{10}$ part: and add these two summes together, as appeareth by this example following.

At 3 s. the péece of any thing, what shall 684 péeces cost me after ỹ rate? First, for 2 shillings I take the $\frac{1}{10}$ of

684,

684, which is 68, in separating the last figure 4, which I must double, and they be 8: I set 8 s. apart from the place of pounds, and then I haue 98 pounds 8 s. for ỹ $\frac{1}{10}$ part, that is to say, for the 2 s. secondly, for 1 s. I take the $\frac{1}{2}$ of the product, that is to say: of 68 li. 8 s. which is 34 li. 4s. and I put the same vnder the 68 li. 8 shill. Then finally, I adde those two summes together, that is to say 68 li. 8 s. and 34 li. 4 s. so they make 102 li. 12 s. and so much are ỹ 684 péces worth at 3 shil. the péce, as may appeare in the margent aboue.

A 1 3 shil.
What 68 | 4?

68 *lib.* 8 *shil.*
34 *lib.* 4 *shil.*
102 *lib.* 12 *shil.*

For 6 shil. take $\frac{3}{10}$ of the number which is to be multiplyed: ỹ is to say, take first $\frac{1}{10}$, then double the product of the same $\frac{1}{10}$, and ad them together. Or otherwise for 4 s. take first the $\frac{1}{5}$ of the number that is to bée multiplyed, then for 2 s. take $\frac{1}{2}$ of the product, and

adde

adde them together.

Or else take for 5 shil. the $\frac{1}{4}$ of the whole summe, then for 1 shil. take the $\frac{1}{5}$ of the product, and adde them together.

Likewise for 7 shil. take first for 5 shil. the $\frac{1}{4}$, then for 2 shil. take the $\frac{1}{10}$ of the nũber which is to be multiplyed, and adde them together.

For 8 shillings take the $\frac{2}{5}$ at twoo sundry times, that is to say, first $\frac{1}{5}$ for 4 shil. and then as much more for o-ther 4 shil. and adde them togethe.

For 9 shil. take first the $\frac{1}{4}$ and like-wise the $\frac{1}{5}$ of the number that is to be multiplied, and adde them together.

For 11 shil. take first the $\frac{1}{2}$ for 10 s. Then for 1 shil. take the $\frac{1}{10}$ of the pro-duct, & adde them together, or else for 5 s. take ỹ $\frac{1}{4}$: then for 4 s̃. take the $\frac{1}{5}$, & lastly for 2 s̃. take the $\frac{1}{2}$ of the last pro-duct, and adde them together.

For 12 shil. take first the $\frac{1}{2}$ for 10 shil. then for 2 s. take the $\frac{1}{5}$ part of the product, and adde them together.

For 13 s̃. take the $\frac{1}{4}$ then the $\frac{1}{5}$, & a-

gaine another $\frac{1}{5}$ of the number which is to be multiplyed, and adde the products together, that is to say: first for 5 shil. take the $\frac{1}{4}$: then for 4 s. take the $\frac{1}{5}$. And againe another $\frac{1}{5}$ for the other 4 s. and ad the thrée products together; the like is to be done in all others, when the price of ỹ thing which is valued, is onely of shillings, as by these examples following doth plainly appeare.

At 6 shil.
What 67?

13 *lib.* 8 *shil.*
6 14

20 *lib.* 2 *shil.*

At 7 shil.
What 347?

86 15
34 14

121 *lib.* 9 *shil.*

At

At 8 shil.
What 540?

108 *lib.*	0 *shil.*
108	0
216 *lib.*	0 *shil.*

At 9 shil.
What 230?

57	10
46	00
103 *lib.*	10 *shil.*

At 11 shil.
What 159?

79	10
7	19
87 *lib.*	9 *shil.*

At 12 shil.
What 349?

174	10
34	18
209 *lib.*	8 *shil*

At 13 shil.
What 267?

66.	15.	
53.	8.	
53.	8.	
173 lib.	11 shil.	

Rule 5. Likewise in multirlying by pence, you shall haue (at the first instant) pounds in the product, in case you know the aliquot parts of the $\frac{1}{10}$ of a pound, or of 24 pence, which are these 12, 8, 6, 4, 3, and 2. For 12, is the $\frac{1}{2}$ of 24, 8 is the $\frac{1}{3}$: 6 is the $\frac{1}{4}$: 4 is the $\frac{1}{6}$: 3 is the $\frac{1}{8}$: and 2 is the $\frac{1}{12}$: but for 12 d. which is 1 shil. I haue before made mention thereof.

For 8 d. you must take the $\frac{1}{3}$ of the $\frac{1}{10}$ and the rest which are the peeces of 8 d. must be doubled to make of them peeces of 4 d. And of the same nũber being doubled, you must take the $\frac{1}{3}$ which will be shillings, & if there doe yet remain any thing, they are thirds of a shilling, being in value 4 pence the peece.

For 6 d. take the $\frac{1}{4}$ of the $\frac{1}{10}$, & of that remaineth, you must take the $\frac{1}{2}$ which shall be shillings: if there doe yet remaine 1, it shall bee in value 6 pence.

For 4 d, you must take the $\frac{1}{6}$ of the $\frac{1}{10}$ and of that which resteth take $\frac{2}{3}$, to make therof shillings: if any thing doe yet remaine, they are thirds of a shilling, being in value 4 pence the peece.

For 3 pence take the $\frac{1}{8}$ of the $\frac{1}{10}$, & of that remaineth, take the $\frac{1}{4}$ to make of them shillings: if any thing doe yet remaine, they are fourths of a shilling, euery one of them beeing worth 3 d.

For 2 d. take the $\frac{1}{12}$ of the $\frac{1}{10}$, & of that which resteth, take $\frac{1}{6}$ the which are shillings, if there doe still remain any thing, they shall be first parts of a shil. euery one being in value 2 d.

For 1 d. you shal vnderstand ỳ it is not possible with ease to bring of d. pounds (into the product) vpon the totall sum: But first you must bring them

them into shil. by the order of the second Rule of this Chapter, and then afterward you shall conuert them into pouds, if néd so require, as by these examples following may appeare.

At 8 *d.*
What 59|6?

19 *lib.* 17 *shil.* 4 *d.*

At 6 *d.*
What 67|8?

16 *lib.* 19 *shil.*

At 4 *d.*
What 93|4?

15 *lib.* 11 *shil.* 4 *d.*

At 3 *d.*
What 57|1?

7 *lib.* 2 *shil.* 9 *d.*

At 2 *d.*
What 36|4?

3 *lib.* 0 *shil.* 8 *d.*

At 1 *d.*
What 67 | 6 ?

5 *lib.* 12 *shil.* 8 *d.*

2 *lib.* 16 *shil.* 4 *d.*

But if the number of pence, be not an aliquot part of 24 pence: Then must you bring them into the aliquot parts of 24, and make thereof diuers products, which must be added together, as shall hereafter appeare.

For 5 pence, you shall first take the 3 pence, then for 2 pence, and ad them together, according to the instruction of the last Rule. Or else, first take for 4 pence, and then for 1 d.

For 7 d. first take for 4 d. then for 3 pence, and adde them together.

For 9 d. take first for 6 d. then for 3 pence adding them together.

For 10 d. first take for 6 d. then for 4 pence, and ad them together.

For 11 d. take first for 8 d. then for 3 d, & add them together: as by these examples following doth appeare.

At 5 d.

What 92 | 7?

11	11	2
7	14	6

19 lib. 6 shil. 3 d.

At 7 d.

What 54 | 3?

8	10	8
6	8	0

14 lib. 18 shil. 8 d.

At 9 d.

What 54 | 6?

13	13	0
6	12	9

20 lib. 9 shil. 6 d.

At 10 d.

What 27 | 3?

9	16	6
4	11	6

11 lib. 7 shil. 6 d.

At 11 d.

What 26 | 4?

	8	16	0
	3	6	0

12 *lib.* 2 *shil.* 3 *d.*

If you will multiply any nũber by shillings, and pence beeing both together, you must take first for ỹ s. according to the instruction of the third rule of this first chapter, then take for the pence after the order of the 5 rule beforementioned: but if there be any aliquot parts of 1 l. containing both shillings and pence, then for these parts you shall take such like part of the number that is to bee multiplied as the number is part of 1 li. ỹ which aliquot parts are these, 6 s. 8 d. 3 s. 4 d. 2 s. 6 d: and 1 s. 8 d. For 6 s. 8 d. is the $\frac{1}{3}$ of a li. 3 s. 4 d. is the $\frac{1}{6}$ of a li. 2 s 6 d. is the $\frac{1}{8}$: and 1 s. 8 d. is the $\frac{1}{12}$ of a li. or of 20 s. And therefore for 6 s. 8 d. you must take the $\frac{1}{3}$ of the nũber that is to bee multiplyed: and if any thing doe remaine, they are thirds of a *Rule. 6.*

of a li. euery one being worth 6 s. 8 pence.

For 3 s. 4 d. you must take the $\frac{1}{2}$ of the number which is to bee multiplyed, and if any thing doe remaine, they are first parts of a li. euery one being in value 3 s. 4 d.

For 2 s. 6 d. you must take the $\frac{1}{8}$: if any thing bee remaining they are 8 parts of a li. each one beeing worth 2 s. 6 pence.

For 1 s. 8 d. you shall take the $\frac{1}{12}$, the number that is to bee multiplyed, and if there doe any thing remaine, they are twelue parts of a Pound, euery one beeing in value 1 shilling 8 pence.

At 6 shil. 8 d.

What 647?

215 lib. 13 shil. 4 d.

At 3 shil. 4 d.

What 220?

36 lib. 13 shil. 4 d.

At

At 2 shil. 6 d.
What 47?

5 *lib.* 17 *shil.* 6 *d.*

At 1 shil. 8 *d.*
What 400?

33 *lib.* 6 *shil.* 8 *d.*

Yéere shal you accustome you selfe to multiply by all sorts of Summes, being composed of shillings, & peuce, which may come in vse or practise. As thus, for 1 s. 1 d. for 1 s, 2 d: 1 s. 3 d. for 1 s. 4 d: Likewise for 2 s. 1 d: 2 s. 2 d. 2 s. 3 d. 2 s. 4 d. And so of al other, cōsidering moreouer, many subtile abbreuiations, which happen oftentimes, that are easie to be conceiued. As thus 11 s. 3 d, after that I haue taken first the $\frac{1}{2}$ for 10 s. Then for 1 s. 3 d. I take the $\frac{1}{8}$ of the product, because 1 s. 3 d. is the $\frac{1}{8}$ of 10 s. in taking the sayd $\frac{1}{8}$ of the product. And by this meanes, when ye haue taken one product, ye may oftentimes vpon ỹ same take another more briefely than vpō *Rule 7.*

the

vpon the summe that is to bée multiplied, which thing you must forefée.

At 11 *shil.* 3 *d.*
What 53?

26	10	0
3	6	3

29 *lib.* 16 *shil.* 3 *d.*

At 6 *shil.* 3 *d.*
What 58?

14	10	0
3	12	6

18 *lib.* 2 *shil.* 6 *d.*

At 12 *shil.* 8 *d.*
What 64?

32	0	0
6	8	0
2	2	8

40 *lib.* 10 *shil.* 8 *d.*

But if you will multiply by poũds shillings, & pence, being altogether: First you must wholly multiply by pounds,

paunds. Then take for the shillings and pence, as in ỹ 6 rule of this chapter is plainely declared. And as by examples following may appeare.

At 3 lib. 6 shil. 8 d.
What 49?

147.	0	0.
16.	6.	8.
163 *lib.*	6 *shil.*	8 *d.*

At 5 lib. 18 shil. 4 d.
What 543?

2715.	0.	0.
271.	10.	0.
135.	15.	0.
90.	10.	0.
3212 *lib.*	15 *shil.*	0 *d.*

At 2 lib. 7 shil. 4 d.
What 927?

1854	0	0
185	8	0
154.	10	0
2193 *lib.*	18 *shil.*	0 *d.*

So theſe rules doe ſerue both to buy
Rule. 9. and ſell. As at ſuch a price the ell, the yard, the peece, the pound waight, or any other thing: how much is ſuch a thing, or ſo many elles worth: Likewiſe they are very neceſſary to cõuert all peeces of gold & ſiluer into poũds: for I may aſwell ſay, at 4 s. 8 d. the frence crowne, what are 135 crowns worth: as to ſay at 4 s. 8 d. the yard of cloth, what are 135 yards worth?

When any one of the ſums which is to be multiplied, is cõpoſed of many denominations: and the other be-
Rule 10. ing of one figure alone: then ſhall yee multiply all the denominations of the other ſumme by the ſame one figure, beginning firſt with that ſum which is leaſt in value towards your right hand, and bring the product of thoſe pence into ſhillings, and the product of the ſhillinges into pounds, as by this example doth appeare.

At 3 lib. 9 ſhil. 8 d. the peece.

What 7?

---

24 lib. 7 ſhil. 8 d.

But

But (if any of the numbers which are to be multiplyed) there be with it a broken nũber, you must (according to his denominator) take one or many parts of the other number, as need doth require, & set the number which commeth thereof vnder the products adding the same together. As thus: At 5 li. 7 s̃. 8 d̃ the grosse, what shall 34 grosse ½ cost? First you shall multiply 5 li. 7 s̃. 8 pence, by 34 grosse, saying 5 times 34 doe make 170 li. Then for 6 s. 8 d. take the ⅓ of 35, which is 11 li. 6 s̃. 8 d̃. Thirdly for 1 s̃. take 34 shil. which is 1 li. 14 s.

At 5 lib. 7 shil. 8 d.
What 34 ½?

170 *li.*	0 *shil.*	0 *d.*
11	6	8
1	14	0
2	13	10
185 *li.*	14 *shil.*	6 *d.*

Finally for the ½ grosse, you must take ½ of ȳ 5 li. 7 s. 8 d. which is 2 li. 13 s. 10 d̃. And then adde your foure products together, so you shall find, that the 34 grosse ½ at 5 pound 7 shillings 8 pence

8 pence the grosse is worth 185 li. 14 s. 6 d. as appeareth in the example aforesaid.

And as in the last example, you did for the $\frac{1}{2}$ grosse, take halfe of the price (that one grosse was worth): & therefore because 1 grosse is worth 5 poũd 7 shillings 8 pence, the $\frac{1}{2}$ grosse must be worth halfe so much. So likewise if you haue $\frac{1}{3}$ of a grosse, or of any other thing, you must take the $\frac{1}{3}$ of the price, that one grosse is worth. And in like maner for the $\frac{1}{4}$ of any thing, you shall take the $\frac{1}{4}$ of the price, also if you haue $\frac{1}{5}$, take the $\frac{1}{5}$ of the price that one is worth, & so of all other fractions, as by these examples following doth appeare.

At 4 lib. 6 shil. 8 d.

What 46 $\frac{1}{2}$?

184	0	0
15	6	8
2	3	4

201 *lib.* 10 *shil.* 0 *d.*

At

At 8 lib. 0 shil. 9 d.

What $54\frac{1}{3}$?

432.	0	0
1	7	0
0	13	6
2	13	7

436 *lib.* 14 *shil.* 1 *d.*

At 3 lib. 16 shil. 8 d.

What $17\frac{3}{4}$?

51	0.	0
8	10	0
5	13	4
1	18	4
0	19	2

68 *lib.* 00 *shil.* 10 *d.*

12 If you will make the proofe of these rules aforesaid, you must first abate the sum of mony (which the fraction of the multiplication doth import) from the totall summe. And divide the rest of the pounds of the said totall summe, by the whole multiplicand, the fraction onely excepted. And

if any thing do remaine after the diuision is made, that remaine shall bée multiplyed by 20: and vnto the product of that multiplycation, you shall ad the shillings which remained of the rest of the totall sum. Againe, if any thing doe remaine after the same diuision, you must multiply the same by 12, and vnto the product ad the pence of the totall summe that remained, if any be left. And thus if ye haue truely wrought, you shall find againe the higher sum of your question, that is to say, the price that one grosse or any other thing is woorth, whereof the question is demaunded.

Or otherwise reduce the remaine of the totall summe (the value of the money that the fraction is woorth being first reduced) all into pence, in multiplying the pounds by 20, and the shillings by 12: adding thereunto, the shillings and pence, which are ioyned with the remaine of the sayd totall summe, if any such be, then diuide those pence by the aforesaid num

ber ỳ is to be multiplied, the fractiõs of the same number being also abated So shall you find the price that one péece, one grosse, or any other thing is valued at; As in the first of the 3 last examples going before, where the totall sum is 101 Pounds. 10 shil. frõ the which I doe abate the price of the halfe grosse which is 2 li. 3 s. 4 d. the rest is 199 l. 6 s. 8 d. which being reduced into pence bringeth 47840 d. I diuide the same by 46, & therof commeth 1040 d. Then I diuide that 1040 pence, by 12 , and they bring 86 shillings 8 d. that is to say, 4 li. 6 shillings 8 d. which is the price that one grosse, or any other thing did cost as in that first example doth appeare.

The like is to bée done of any maner of thing that is sold by the Hundred, after 5 score to the hundreth. *Rule 13*
As thus: at 12 pound 7 shillings 6 d. the 100 pounds waight, what shall 374 pounds waight cost? You shall first multiply 12 poũds, 7 shillings 6

pence, by 374 that is to say, by three Hundreth. Then for 50 poũd waight you shall take the $\frac{1}{2}$ of 12 li. 7 s. 6 d. because 50 li. is the $\frac{1}{2}$ of 100 l. Likewise for 20 li. waight which is the $\frac{1}{5}$ of 100 li. you shall take the $\frac{1}{5}$ of 12 li. 7 s. 6 d. Lastly for 4 li. waight you must take the $\frac{1}{5}$ of the last product. This done, you must ad all these products into one summe, which will make the sum of 46 li. 5 s. 7 d. $\frac{4}{5}$: as by this example above written doth appeare.

At 12 *lib.* 7 *shil.* 6 *d.*
What 3|74?

37.	2.	6.
6.	3.	9.
2.	9.	6.
0.	9.	10. $\frac{4}{5}$

46 *li.* 5 *shil.* 7 *d.* $\frac{4}{5}$

The proofe is made by reducing the totall sum into pence. And to diuide the product by the nũber that is to be multiplied, that is to say, by 374, likewise diuide the quotient produced of that first diuision by 12: so shall you find againe the higher summe 12 li. 7 s. 6 d. which is the price of a 100 li. waight

waight, as before.

Also the like may be done of our vsual waight héere in England (which is 112 li. for euery Hundred Pound waight) in case you know the aliquot parts of a 100, that is to say, of 112 li waight, which are these, 56 li. 28 li. 14 li. & 7 li. For 56 li. is the $\frac{1}{2}$ of 112: 28 li. is the $\frac{1}{4}$ of 112 li. 14 li. is the $\frac{1}{8}$, and 7 li. is the $\frac{1}{16}$.

Therefore for 56 li. take the $\frac{1}{2}$ of the summe of money, that the 112 pound waight is worth.

For 28 li. take the $\frac{1}{4}$ of the Sum of money that the 112 li. is the worth.

For 14 li. take the $\frac{1}{8}$ of the summe that the C is worth.

For 7 li. take the $\frac{1}{16}$ of the sum of money that the C is worth.

As thus, at 3 li. 6 s. 8 d. ȳ hundreth pounds waight, that is to say, ȳ 112 li. what shall 24 hundreth 3 quarters 21 li. waight cost after the rate?

First, you shall multiply 24 hūdreth by 3, which is the 3 li. and therof wil come 72 li. then for 6 s. 8 d, which is

the $\frac{1}{3}$ of 10 s. you shall take the $\frac{1}{3}$ of 24, which is 8 li. for 24 Nobles, maketh 8 li. afterward, for the 3 quarters of ỹ C. you shal first for the 56 li. take the $\frac{1}{2}$ of 3 li. 6 s. 8 d. because 56 li. is ỹ $\frac{1}{2}$ of the C. and thereof commeth 1 li. 13 shil 4 d. then for 28 li. (which is ỹ quarter of a C.) you shall take the $\frac{1}{4}$ of 3 li. 6 s. 8 d. or els the $\frac{1}{2}$ of the product, which cõmeth last of 56 li. which is 16 s. 8 d. likewise for 14 li. you must take the $\frac{1}{8}$ of 3 li. 6 s. 8 d. which is 8 s. 4 d. or else the $\frac{1}{2}$ of the product ỹ commeth of 28 li. which is all one. Finally for 7 li. take the $\frac{1}{16}$ of 3 li 6 s. 8 d. or els the $\frac{1}{2}$ of ỹ last product that cõmeth of 14 li. & therof cõmeth 4 s. 2 d. Then add all these products together: and the totall summe will be 83 li. 2 s. 6 d. so much are ỹ 24

At 3 lib. 6 shil. 8 d.
What 24 C. 3. qu. 21 li.

72	0	0
8	0	0
1	13	4
	16	8
	8	4
	4	2

83 *li.* 2 *shil.* 6 *d.*

C. 3 quarters, £ 21 li. waight worth after 3 li 6 s. 8 d. the hundreth, as appeareth in the margent.

The prose hereof is made, like to the other proses aforesayd; sauing that wherein those proses you abate the price of the money, that the fraction was worth, from the totall sum. Here in this example (and in such other like) you must abate the price of the money, that the od waight amounteth vnto (ouer and aboue the iust hundreths) from the said totall sum: the rest thereof shall you conuert into pence, diuiding the product of the multiplication by the iust number of the number of the hundreths, so shall you find the pence, that one Hundreth is worth: which you shall bring into pounds by the order of diuision, and so of all other.

Chap. 2.

Of the Rule of Three composed, the which is distinct into Foure Rules, *each of them differing, the one from the other.*

THere belongeth to the first and second parts of the Rule of three composed alwaies 5 numbers: whereof (in the first part of the Rule of three composed) the second number & the fift, are alwaies of one semblance and like denominatiõ: whose rule is thus. You must multiply the first number
Rule. 1. by the second, and that shall bee your diuisor, then multiply the other three numbers the one by the other to bee your diuidend.

Example of this first part, if 100 Crownes in 12 Moneths, doe gaine 15 li. what will 60 Crowns gaine in 8 Moneths? Answ. First multiply 100 Crowns by 12 moneths, & thereof cõmeth 1200 for your diuisor, then multiply 15 li. by 60 crownes, & by 8 moneths, and you shall haue 7200; wherefore diuide 7200 by 1200, and therof commeth 6 li; so many li. will 60 crownes gaine in 8 moneths: this Question may bee done by the double rule of 3, that is to say, by ỹ rule of 3 at 2 times. But yet this rule of 3 cõ-

posed

posed is more breefe.

Crownes.	*months.*	*pounds.*	*crownes.*	*months.*
100	12	15	60	8

X

72|00

X2|00 6 *lib.*

2 In the second part of the rule of three composed, the third number is like vnto the fift, whereof the rule is thus, you must multiply the third nũber by the 4, and the product shall be your diuisor, then multiply the first number by the second, and the product thereof by the fift, the which number shall be your dividend, or nũber that is to be diuided: as by exauple. *Rule 2.*

When 60 crowns in 8 moneths do gains 6 li. in how many months will 100 crowns gaine 15 li? Answere. Multiply the third number 6 by the fourth number 100: and therof commeth 600: which shall bee your diuisor, then multiply the first number 60 by the second number 8 and the pro-

duct

duct thereof by the fift number 15 and thereof will come 7200: then diuide 7200, by 600, and the quotient will be 12, in so many monethes will 100 crowns gaine 15 li. This question may likewise be done by the rule of 3, at 2 times.

Crownes.	*months.*	*pounds.*	*crownes.*	*pounds.*
60	8	6	100	15

X

7 2 | 00 *moneths.*

6 6 | 00 (12

In the third part of the Rule of 3 composed there may be 5 uumbers, or more: and in this rule, ỹ first number and the last are alwaies dissemblant and of vnlike denomination, the one to the other: and the question is from the last nũber vnto the first, whereof the rule is thus, you must multiply that number which you would know by those numbers which doe giue the value, & diuide ỹ product of the same by the multiplication of the numbers

Rule. 3.

which

which are already valued, as by example. If 4 deniers Parisis be worth 5 deniers Tournois, and 10 deniers tournois, be worth 12 denires of Sauoy, I demaund how many deniers Parisis are 8 deniers of sauoy worth? Answ. Multiply 8 deniers of sauoy (which is the number that you wold know) by 4 deniers parisis, and by 10 deniers tournois which are the numbers that giue the value, & they make 320: thẽ multiply 5 den. tournois, by 12 deniers of Sauoy which are the numbers already valued, & they make 60: Finally diuide 320 by 60, & you shall find 5 deniers $\frac{1}{3}$ parisis, so much are the 8 deniers of Sauoy worth.

Parisis.	*Tournois.*	*tournois.*	*Sauoy.*	*Sauoy.*
4 *d.*	5 *d.*	10 *d.*	12 *d.*	8 *d.*

320 | 0 *par.*

8 | 0 (5 *d.* $\frac{1}{3}$.

In the fourth part of the rule of 3 composed: the first number and the last

last are alwaies semblant and of one denomination, & the question of this rule, is alwaies from the last number to that last sauing one, whereof there is a rule which is thus. You must multiply ỹ number which you would know, by the numbers that are already valued, & diuide the product of the same, by the multiplication which commeth of the numbers that gius the value, as by example.

Rule. 4.

If 4 deniers Parisis, be worth 5 deniers Tournois, & 10 deniers tournois, be worth 12 deniers of Sauoy: I demaund how many Deniers of sauoy, are 15 deniers parisis worth? Answer. Multiply 15 Deniers Parisis that you wold know, by 5 deniers Tournois, & by 12 Deniers of Sauoy, which are the numbers already valued, and they make 900. Diuide the same by 4 times 10, which are the numbers that do giue the value, that is to say, by 40, and you shall find 22 Deniers $\frac{1}{2}$ of Sauoy: so much are the 15 Deniers Parisis worth.

Pariſis. Tournois. tournis. Sauoy. Pariſis.
4 d. 5 d. 10 d. 12 d. 15 d.

£ 2	
ø ø	o *Sauoy.*
A A	o 22 D. $\frac{1}{2}$.

The Third Chapter treateth of queſtions of the trade of Marchandize, in *the which is taught the rule of Three in Fractions, beginning 5 at the Queſtion following.*

IF 31 Deuenth. Dozens, do coſt me 100 li. 15 s̄. what ſhall 4 Dozens coſt after the ſame rate? Anſw. Firſt bring the 100 li. 15 s. all into ſhillings, in multiplying the 100 li, by 20,, and adding to the product the 15 ſhil. and thereof commeth 2015 ſhil. then multiply 2015 by the third number 4, and diuide the product by 31, & ỹ quotient will bée 260 s̄. The which diuide againe by 20, and thereof commeth 13 li. And ſo much are the 4 Dozens worth.

Dozens.

Dozens.	*Lib.*	*ſhil.*	*Dozens.*
31.	100	15	4

20

2015

4

8060

X
XX
XXXX (260

XXX
XX

If 4 dozens bée worth 13 li. what are 31 Dozens worth by the price? Anſw. Multiply 31 by 13, & thereof commeth 403. The which you ſhall diuide by 4, and therof commeth 100 li. $\frac{3}{4}$ which $\frac{3}{4}$ are 15 s. and ſo much are 31 Dozens worth, as before.

Dozens.	*lib.*	*Dozens.*
4	13	31

13

93

31

403

403

AAA (100 li. $\frac{3}{4}$. 3

3. If 49 elles be worth 2 li. 4 s. 11 d. what are 18 ells worth by ỹ price? First you must bring 2 li. 4 s. 11 d. all into pence, in multiplying 2 li. by 20 maketh 40: adde thereto 4 shillinges they make 44 s. the which multiply by 12 d. and they make 528 d. wherunto adde 11 d. all is 539 d. the which 539 d. must bée your second number in the rule of thrée, then multiply 539 by the third number 18, and thereof commeth 9702, diuide the same by 49, & you shall haue in your quotient 198 d. the which diuide by 12, & you shall find 16 s. 5 pence: so much are the 18 elles worth.

Elles.	*lib.*	*shil.*	*d.*	*Elles.*
49	2	4	11	18
	20			539
	44			18
	12			4312
	88			539
	441			
	1			
	539			9702

xx	x
xxx	vi
xxxvi	xcviii (16 ſhil. 6 d.
xcviii (198.	xxx
xcviii	x
xx	

4 If 18 elles bee worth 16 s. 6 d. what are 49 elles worth by ẏ price? Anſwere. Bring 16 s. 6 d. into pence in multiplying 16 by 12, and therof cõmeth 198 d. with the 6 d. added to it, thẽ multiply 198 d. by 49, ẏ product wilbe 9702. The which diuide by 18 elles, and thereof cõmeth 539 s. Thẽ diuide 539 by 12, & the product therof by 20: So ſhall you haue 2 li. 4 ſhil. 11 d. and ſo much are the 49 elles worth.

Elles.	*ſhil.*	*d.*	*Elles.*
18	16	6	49
	12		198
	32		392
	166		441
	198		49
			9702

xx

17	1
446	181
8702 (539	138 (44 shil.
1888	122
11	1

Note that whereas in the first part of this Booke, I haue set forth the rule of three both in whole numbers, and also in fractions: now I wil shew you how to do the said Rule of Three, in fractiõs more at large. And because I would haue you to vnderstand the same generally, you must first cõsider if the three numbers that shal bee proponed (in any question of the sayd rule of three) be all fractions, yea, or no: which if they bee all 3 numbers fractions, then must you worke as followeth.

First you must Multiply the Numerators of the second & third fractions in your rule of Three, the one by the other, and againe you must multiply that product, by the denomina-

toꝛ of the firſt fraction: and the number which commeth of this laſt multiplycation, ſhall be your diuidend, oꝛ number that muſt be diuided.

Secondly, you muſt multiply likewiſe the denominatoꝛs of the ſecond and third fractions in your ſaid Rule of thꝛée, the one by the other, and the off-come againe by the numeratoꝛ of the firſt fraction. And the number which is pꝛoduced of that multiplycation, ſhall be your diuiſoꝛ.

Thirdly, you muſt diuide the aforeſaid diuidend by the diuiſoꝛ, and the quotient will bée the anſwere to the queſtion, as by Examples ſhall héereafter appeare.

But if you find whole numbers and fractions together, in the ſaid Rule of thꝛée: you muſt firſt reduce the ſame into their fractiõs by the 6 reduction.

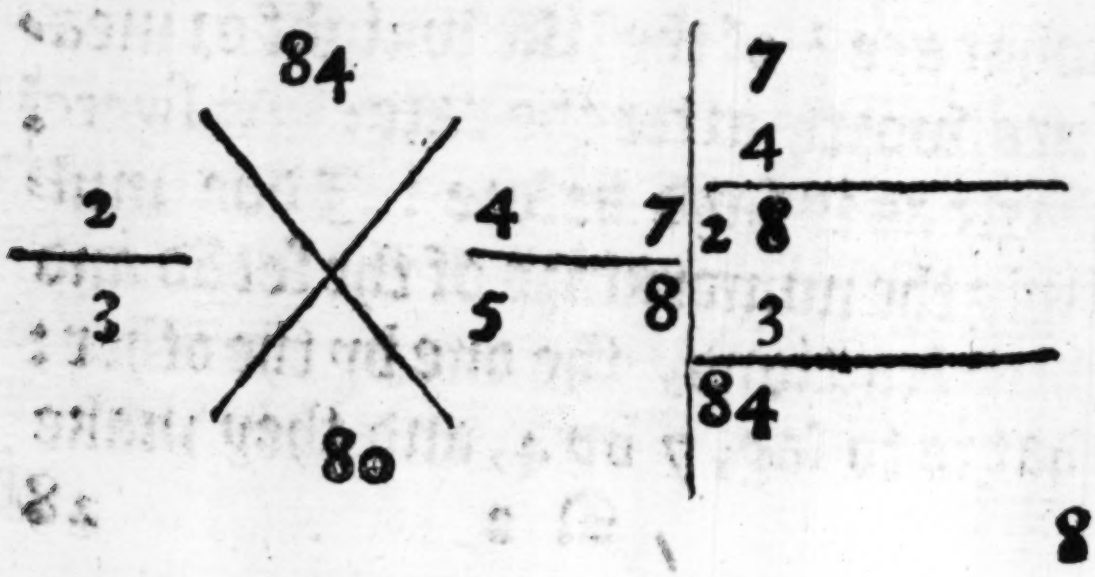
Likewiſe if you find any of the thꝛée

thrée numbers in your rule of thrée, to be whole nũbers, alone without any fraction ioyned with it, you muſt in this caſe put 1 vnder the ſame whole number with a line betwéene them both: The which 1 doth repreſent the denominator to the ſame whole nũber, & then you muſt procéed to worke the Rule of thrée in like manner, as though they were all fractions: as before is ſaid.

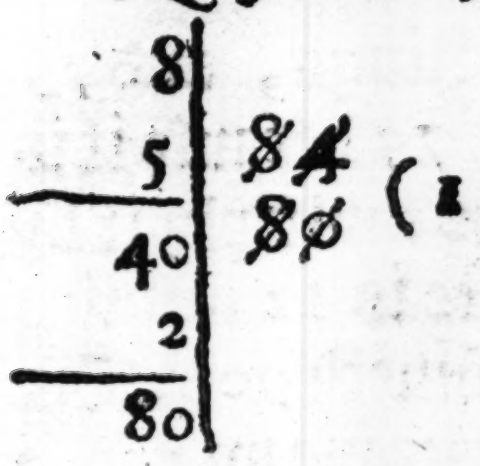
The Examples of all three differences aforeſaid, doe follow in the *Three next queſtions orderly.*

IF $\frac{2}{3} \times \frac{4}{5} \frac{7}{8}$: I doe vnderſtand thereby thus as followeth. If $\frac{2}{3}$ of any waight, or meaſure be worth $\frac{4}{5}$ of Twenty ſ. or of any other Summe, what are $\frac{7}{8}$ of the like waight or meaſure worth after the rate? Anſwere: Firſt as is ſayd before: I doe multiply the numerators of the ſecõd and thirrd fractions, the one by the other: that is to ſay, 7 by 4, and they make

28: againe, I do multiply the sayd 28 by the denominator of the first fraction, that is to say, by 3, and thereof commeth 84 the which 84, I set ouer the crosse for my diuidend. Secondly I doe multiply the denominators of the second and third fractions the one by the other: Namely 8 by 5, and they make 40: againe I do multiply the said 40 by the numerator of the first fraction: that is to say, by 2, and thereof commeth 80, the same 80 I doe set vnder the crosse for my diuisor. Then I diuide 84 by 80, and there commeth in the quotient 1 li. & $\frac{4}{80}$ remaining, the which $\frac{4}{80}$ being abbreuied, maketh $\frac{1}{20}$ of a pound, which is worth 12 d. And so much wil the aforesaid $\frac{7}{8}$ cost, as by the worke following, doth appeare.



8



6. If $\frac{2}{5}$ of an elle of any marchandize do coſt me 12 ſhil. 7 d. the which 7 d. doth make $\frac{7}{12}$ what will $\frac{9}{10}$ of an elle coſt me after the ſame rate? Anſwe. Firſt I ſet downe my nũbers as followeth. If $\frac{2}{5}$ × 12 $\frac{7}{12}$. $\frac{9}{10}$. Then by the 6 reduction I reduce 12 $\frac{7}{12}$ all into Twelues, and they make $\frac{151}{12}$ for the ſecond number in my rule of three which muſt ſtand in ỹ place of 12 $\frac{7}{12}$. And then will my 3 numbers ſtand thus as followeth, $\frac{2}{5}$ × $\frac{151}{12}$. $\frac{9}{10}$. Then I multiply 151 by 9, & the off come by 5, and thereof cõmeth 9795, the which I doe ſet ouer the croſſe for my diuidẽd. Likewiſe I multiply 12 by 10, and the of come by 2, and thereof commeth 240: which I do ſet vnder the croſſe for my diuiſor. Then I diuide 6795, by 240: and therof cõmeth

in the quotient 28 ſhillings, and 75 remaining, the which 75 becauſe it is the remaine of 8. I doe multiply it by 12 pence, for that there is 12 pennies in a ſhil. and therof cõmeth 900. The ſaue 900, I diuide againe by 240, & thereof commeth 3 pence, and 180 remaining, which 180 I doe ſet apart ouer 240, with a line betwéene them both, & they are $\frac{180}{240}$. The which being abbreuied, do make $\frac{3}{4}$ of a penny. And thus I find that the $\frac{9}{10}$ of an elle ſhall coſt 28 s. 3 d. $\frac{3}{4}$, as appearth.

151	12		6795			
	12					
7	24	2		151		9
12	127	5		12		10
12	151		240			

151	12	1 3
9	10	2 9 7
1359	120	6 7 9 8. (28 ſhil.
5	2	2 4 0 0
6795	240	2 4

75	1
12	38
150	900 (3 d $\frac{180}{240}$.
75	240
900	$\frac{3}{4}$

7 If $\frac{3}{5}$ of an elle doe coſt me 8 ſhillings, what will 7 elles $\frac{1}{2}$ coſt me after the rate? Anſwere. I doe firſt reduce the whole number and broken into his broken by the firſt Reduction, that is to ſay $7\frac{1}{2}$ into halfes, and they are $\frac{15}{2}$, which muſt be the third number in my rule of thrée, the ſecond nũber is 8 ſhil. but I muſt (as before is taught) put 1 vnder 8 with a line betwéen them, to make it like a fraction thus, $\frac{8}{1}$. Then muſt my thrée numbers in my Rule of thrée, ſtand after this manner: $\frac{3}{5} \times \frac{8}{1}$. $\frac{15}{2}$. Then I doe multiply 15 by 8, & the product therof by 5, amounteth 600: The which I do ſet ouer the croſſe, for my diuidend Likewiſe I doe multiply 2 by 1, and the product thereof by 3, and thereof commeth 6, the which I doe ſet vnder

the croſſe for my diuiſor. Then I diuide 600 by 6, and I find in my quotient 100: the which is 100 ſhil: I do therfore diuide 100 by 20 ſhil. and my quotient is 5 li. And ſo much wil the 7 elles $\frac{1}{2}$ coſt mee, as hereafter doth appeare.

	7
	2
$7\frac{1}{2}$	14
	1
	15

600

$\frac{3}{5}$ × $\frac{8}{1}$ $\frac{15}{2}$

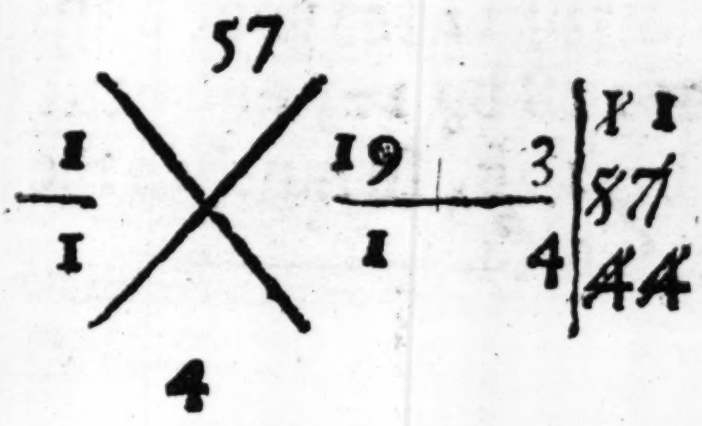
6

15	2
8	1
120	2
5	3
600	6

£ ø ø. (100 ſhi. | 1ø0 (5 li.
£ ø ø | 2ø

If 1 yard of Veluet coſt 19 ſhil. what ſhall $\frac{3}{4}$ of a yard coſt? Anſwere. Set downe your numbers thus: If $\frac{1}{1}$ × $\frac{19}{1}$. Then multiply 1 times 19, by 3; and thereof commeth 57 for your

your diuident, or number to be diui-ded. The which 57 you shal diuide by 1 times 1, 4 times, which are 4, and your quotient wil be 14 s. $\frac{1}{4}$, which $\frac{1}{4}$ is worth 3 d. so much are the $\frac{3}{4}$ of a yard worth after 19 shil. the yarde, as by practise followeth.



Or otherwise by ỹ rules of practise: first for $\frac{2}{4}$ of a yarde which is $\frac{1}{2}$ of a yard, you must take the $\frac{1}{2}$ of 19 shil. which is 9 s. 6 d. then for $\frac{1}{4}$ of a yard take the $\frac{1}{2}$ of ỹ product, that is to say, of 9 s̄. 6 d. and therof cõmeth 4 s. 9 d. ad these numbers together, and you shall haue 14 s. 3 d.

as aboue is sayd, and as appeareth héere in the margent.

19 shil.

9 shil. 6 d.

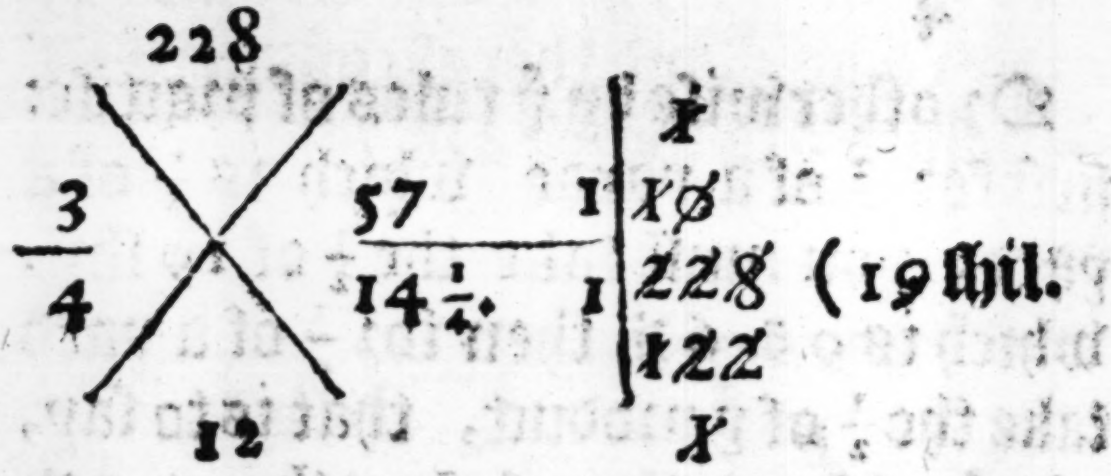
4 9

14 3

9 If $\frac{3}{4}$ of a yard of Velvet doe cost

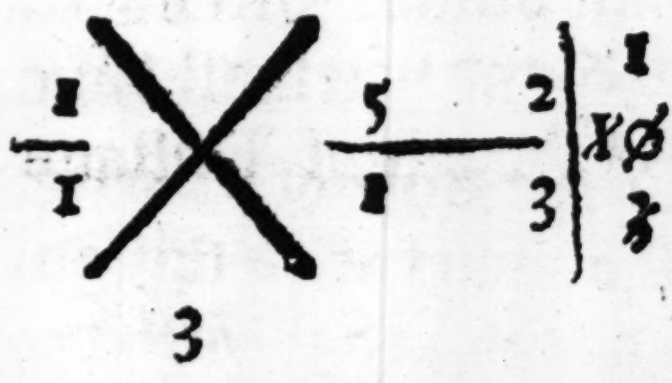
14 s.

14 ſhil. 3 d. what ſhall 1 yard coſt?
Anſwere. Set your numbers downe thus: If $\frac{3}{4}$ × 14 $\frac{3}{4}$. $\frac{1}{1}$. Reduce 14 $\frac{1}{4}$ into a fraction, and they will bée $\frac{57}{4}$, then multiply 57 by 1, 4 times, and therof commeth 228 for your diuidẽd. Likewiſe multiply 1 times 4, 3 times and therof commeth 12 for your diuiſor: then diuide 228 by 12, and your quotient will be 19 s. ſo much is the yard of Veluet worth.


228
3
4
57
14 1/4.
12
1
1
1

14 ſhil.	3 d.
4	9
19 ſhil.	0 d.

10 If one elle of Holland cloath bée woꝛth 5 s. what are $\frac{2}{3}$ woꝛth after the rate? Anſ. Say thus, if $\frac{1}{1} \times \frac{5}{1} \cdot \frac{2}{3}$. Thẽ multiply 2 times 5, one time, & thereof commeth 10 foꝛ your diuidend: likewiſe multiply 3 times 1, one time they make 3 foꝛ your diuiſoꝛ, then diuide 10 by 3, and therof commeth 3 s. $\frac{1}{3}$, which $\frac{1}{3}$ is woꝛth 4 d. and ſo much are the $\frac{2}{3}$ of an elle woꝛth.



Oꝛ otherwiſe, by the rule of practiſe: take firſt the $\frac{2}{3}$ of 5 s̃. foꝛ ỹ $\frac{1}{3}$ of an elle and that is 1 s̃. 8 d̃. Likewiſe, foꝛ the

other

other $\frac{1}{3}$ of an elle, take again another $\frac{1}{5}$ of 5 s. which is alſo 1 ſhilling, 8 d. and adde them together, and ſo ſhall you haue 3 s. 4 d. as before.

5 *ſhil.*	
1	8
1	8
3 *ſhil.*	4 *d.*

11 If $\frac{2}{3}$ of an elle of Holland cloth doe coſt me 3 s. 4d. what ſhall 1 elle coſt? Anſw. Set downe your numbers thus: if $\frac{2}{3}$ × 3 $\frac{1}{3}$. $\frac{1}{1}$. Firſt reduce 3 $\frac{1}{3}$ all into thirds, and it will be $\frac{10}{3}$. Then multiply 1 times 10, 3 times, and thereof commeth 30 for your diuidend. Likewiſe multiply 1 times 3, 2 times, and your diuiſor will bee 6, thē diuide 30 by 6, and you ſhall haue 5 ſhil. ſo much is the elle of Holland cloth worth.

30

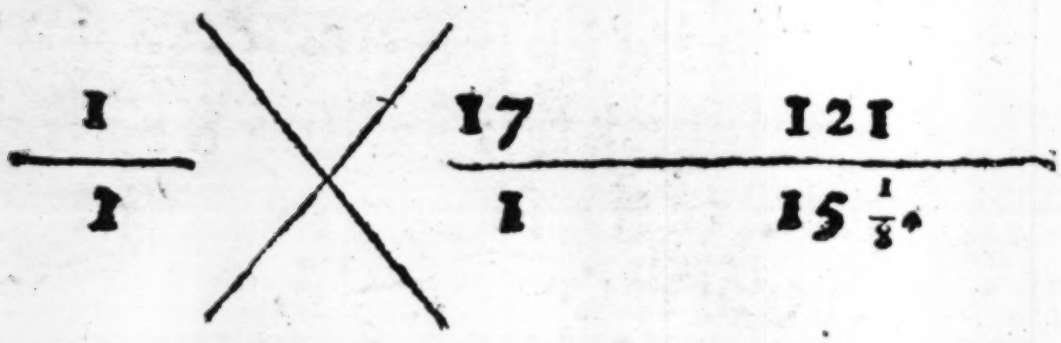
$\frac{2}{3}$ × $\frac{10}{3}$ $\frac{1}{1}$ $\frac{30}{6}$ (5 *ſhil.*

6

Or otherwiſe by practiſe, take the $\frac{1}{2}$ of 3 s. 4 d. which is 1 ſhilling 8 pence, and adde it to the ſame 3 ſhillings, 4 d. and therof will come 5 s. as before. For the $\frac{1}{3}$ of 5 s. is as much as the $\frac{1}{2}$ of 3 s. 4 d. which was the price that the $\frac{2}{3}$ of an elle did coſt, as appeareth.

3 *ſhil.*	4 *d.*
1	8
5 *ſhil.*	0 *d.*

12 If one elle coſt me 17 s. what ſhal 15 ells $\frac{1}{8}$ part coſt? which $\frac{1}{8}$ is halfe a quarter of an elle. Anſw. Say if $\frac{1}{2} \times \frac{17}{1}$. 15 $\frac{1}{8}$. Firſt reduce 15 $\frac{1}{8}$ into eight parts, and they make $\frac{121}{8}$ then multiply 121 by 17, 1 time, & therof commeth 2057, for your dividend. Likewiſe multiply 8 times 1, 1 time, and the product will be 8, for your diviſor, then diuide 2057, by 8, and you ſhall find 257 ſhil. $\frac{1}{8}$, which is 12 li. 17 s. 1 d. $\frac{1}{2}$ & ſo much are the 15 elles $\frac{1}{8}$ worth, as by practiſe doth appeare in the page following.



Or otherwise, for 10 s. take the $\frac{1}{2}$ of 15, which is 7 l. 10 s. then for 5 s. take the $\frac{1}{2}$ of 7 li. 10 s. which is 3 li. 15 s. Thirdly, for 2 s. take the $\frac{1}{5}$ of 7 l. 10 s. because y^{t} $\frac{1}{5}$ of 10 s. is 2 s. Fourthly, for the $\frac{1}{8}$ of the elle,

you shall take the $\frac{1}{8}$ of 17 shil. which	15 $\frac{1}{8}$ 17		
is 2 shil. 1 penny: $\frac{1}{2}$	7	10	0
Then adde all	3	15	0
these summes to-	1	10	0
gether, and you		2	1 $\frac{1}{2}$.
shall find 2 li.	12 *li.* 17 *shi.* 1 *d* $\frac{1}{2}$.		

17 shil. 1 peny $\frac{1}{2}$. as before, and as appeareth more plainly in the former practise.

13 If 25 elles be worth 2 li. 3 s. 4 d. what are 18 elles $\frac{3}{4}$ worth by y^{t} price? Answere. First put 3 s. 4 d. into the part of a li. and you shall haue $\frac{1}{6}$: then say if $\frac{25}{1}$ giue me 2 li. $\frac{1}{6}$, what shall 18 $\frac{3}{4}$ giue?

$\frac{3}{4}$ giue: put the whole numbers 6 into their broken, and then multiply 1 times 13 by 75, the product will bee 975, the which you shall diuide by 25 times 6,4 times: which maketh 600. Then diuide 975 by 600 : and your quotient will be 1 li. and 375 will remaine, the which 375 you shall multiply by 20, & thereof will come 7500 diuide the same by 600, your quotient will be 12 s. and 300 wil remain, the which abreuied is $\frac{1}{2}$ which is 6d: thus the 18 elles $\frac{3}{4}$ are worth 1 li. 12 s. 6d. as by practise will appeare.

$$\frac{13}{\frac{25}{1} \times 2\frac{1}{6}} \qquad \frac{75}{18\frac{3}{4}}.$$

Or otherwise by the rules of practise, for because that 12 ells $\frac{1}{2}$ is the $\frac{1}{2}$ of 25 elles, therfore take the $\frac{1}{2}$ of 2 li. 3 s. 4 d. which is 1 l. 1 s. 8 d. then for 6 ells $\frac{1}{4}$ take the $\frac{1}{4}$ of 2 li. 3 s. 4 d. or els the $\frac{1}{2}$ of the last product, (that is to say, of 1 l. 1 s. 8 d.) which is all one, & add them together, so shall you haue 1 li. 12 s. 6 d. as before.

2 *Lib*

lib.	*ſhil.*	*d.*
2	3	4
1	1	8.
	10	10
1 *lib.*	12 *ſhil.*	6 *d.*

14. If 15 yards be worth 32 s. what are halfe a yarde and halfe a quarter, or els $\frac{5}{4}$ of a yard worth? Anſwere. Say if $\frac{15}{1}$ giue $\frac{32}{1}$, what will $\frac{5}{8}$ giue? Multiply 1 times 32 by 5, and diuide the product by 15 times 8 times, and your quotiēt wilbe 1: and $\frac{40}{120}$ remaining, which is $\frac{1}{3}$ of a ſhi. that is to ſay 4 d. and ſo much are the $\frac{5}{8}$ of a yarde worth, that is to ſay 1 s. 4 d.

$$\frac{15}{1} \times \frac{32}{1} \quad \frac{5}{8}$$

Or otherwiſe, ſée what the yard is worth after the maner aforeſaid in ye other examples, and you ſhall find that the yard is worth 2 s. 1 d. $\frac{3}{5}$: of the which number take firſt the $\frac{1}{2}$ for $\frac{4}{8}$, which is 1 s. 0 d. $\frac{4}{5}$, of the which number, take the $\frac{1}{4}$ for the other $\frac{1}{5}$,

which

which is 3 d. $\frac{1}{5}$, adde these two numbers together, and you shal find the $\frac{5}{6}$ to be worth 1 s. 4 d. as before is said.

2 shil.	1 d.	$\frac{3}{5}$.
1	0	$\frac{4}{5}$.
	3	$\frac{1}{7}$.
1 shil.	4 d.	0

15 If 13 elles $\frac{1}{6}$ be worth 27 shil. what are 10 ells $\frac{2}{3}$ worth by y price? Answ. Say if 13 $\frac{1}{6}$ giue $\frac{27}{1}$, what shall 10 $\frac{2}{3}$ giue? Put the whole numbers into their broken, and you shall find $\frac{83}{6}$ $\frac{27}{1}$, and $\frac{32}{3}$. Then multiply 6 times 27, by 32, & thereof commeth 5184, the which number you shal diuide by 83 times, 1, 3, times & you shall find 20 shil. $\frac{68}{133}$, which fraction is worth 8 d. $\frac{69}{133}$, parts of a peny.

$$\frac{83}{13\frac{1}{6} \times \frac{27}{1}}. \qquad \frac{32}{10\frac{2}{3}}.$$

16 If 2 yards $\frac{1}{2}$ be worth 4 s. 8 d. what are 8 yards $\frac{1}{4}$ worth? Answer.

put ỹ 8 s. into the part of a chilling, setting 8 ouer 12, and it will bee $\frac{8}{12}$ which abbreuied are $\frac{2}{3}$, then reduce whole numbers into 3 broken, and they will stand thus: $\frac{5}{2}$, $\frac{14}{3}$, $\frac{33}{4}$, then multiply 2 times 14 by 33, and diuide ỹ product by 5 times 3, 4 times: and you shall find 15 s. and $\frac{24}{60}$ wil remaine which are worth 4 pence, $\frac{4}{5}$ so much are the 8 yards $\frac{8}{4}$ worth.

$$\frac{5}{2\frac{1}{2}} \quad \frac{14}{4\frac{1}{3}} \quad \frac{33}{8\frac{1}{4}}$$

17 If 1 kersey be worth 2 li. 6 s. 8 d. how many Kerseis shal I buy for 36 li. 3 s. 4 d after the rate? Answ. Put 6 s. 8 d. into the part of a li. and you shall haue 2 li. $\frac{1}{3}$, for the first number in the rule of 3, and 1 kersey for ỹ second number: then put 3 s. 4 d. into the part of a li. and it is $\frac{1}{6}$, so you shal haue 36 li. $\frac{1}{6}$ for the third nũber, then will your 3 numbers in the rule of 3 stand thus. $2\frac{1}{4} \times \frac{1}{1}$. $36\frac{1}{6}$. Then reduce the whole numbers into their

broken, & it will be thus, $\frac{2}{3} \times \frac{1}{1} \frac{217}{6}$. Then multiply 3 times 1 by 217, & thereof will come 651 for your diuidend. Likewise multiply 7 times 1 by 6: and the product thereof will be 42. Then diuide 651 by 42, and you shall find 15 $\frac{3}{2}$. So many kerseys of 2 li. 6 s. 8 d. the pece, shall you haue for 36 li. 3 s. 4 d.

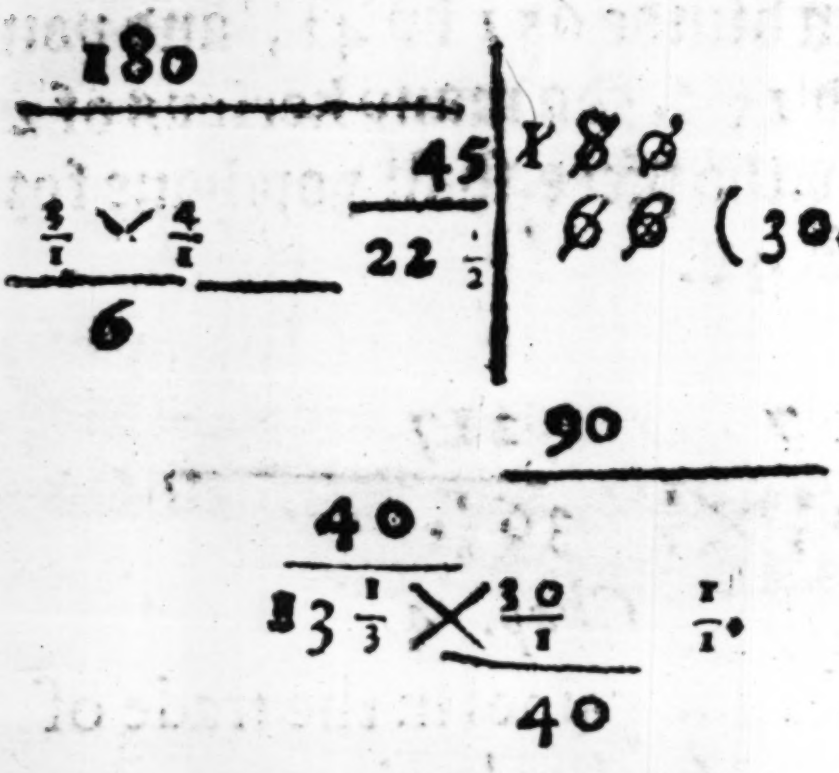
$$\frac{7}{2\frac{2}{3} \times \frac{1}{1}} \quad \frac{217}{36\frac{1}{6}}$$

Chap. 4.

Of losses and gaines in the trade of *Marchandize.*

1. IF 13 yards $\frac{1}{3}$ be worth 22 pound 10 s. how shall I sell 1 yarde to gaine $\frac{1}{3}$, or to make 3, 4? which is all one. Answ. Say by the ruls of Three, if 3 do yeld 4. what will 22 $\frac{1}{2}$ yeld? multiply & diuide & you shall find 30 li. Then say againe by the rule of 3, if 13 yards $\frac{1}{2}$ doe giue 32 li. as well of principall as of gaine: what will

1 yard be woꝛth by the pꝛice: Multiply and diuide, and you shall find 2 li. 5 s. and foꝛ that pꝛice must the yard be sold to gaine the $\frac{1}{3}$, oꝛ to make of 3, 4.



Oꝛ otherwise, take the $\frac{1}{3}$ part of 22 li. 10 s. which is 7 li. 10 s. that shall you adde with 22 li. 10 s. & you shall haue 30 li. as beꝛe. Then diuide by 13 $\frac{1}{3}$, and you shall finde 2 li. 5 s. as aboue is sayd.

	li.	shi.
30	22	10
00	7	10
	30	00

2. If one yarde be woꝛth 27 s. 6 d. foꝛ

for how much shal 16 yards $\frac{2}{3}$ be sold to gaine 2 s. vpon the li. of money? that is to say, vpon 20 s? Answ. Ad 2 s. vnto 20, and you shall haue 22, then say: If 20 s. principall do giue 22 s, principal and gaine: how much will 27 s.6 d. principall yéeld? Multiply & diuide, and you shall find 30 s. $\frac{1}{4}$: then say againe by the rule of 3. If 1 yard doe giue me 30 s. $\frac{1}{4}$ (which is aswel the principall as the gaine) what shall 16 yards $\frac{2}{3}$ giue me? Multiply and diuide, and you shall finde 25 li 4 s.2 d. For the same price shall the 16 yardes be sold to gaine after the rate of 2 s. vpon the pound of money, or vpon 20 s. which is all one.

55	121	50
$\frac{20}{1}+\frac{22}{1}$	$27\frac{1}{2}$ |	$\frac{1}{1}\times 30\frac{1}{4}$	$16\frac{2}{3}$

3 If 10 yards $\frac{2}{3}$ be worth 25 li. 10 s. for how much shall 2 yards $\frac{1}{2}$ be sold to gaine after 10 li vpon the 100 li. of money? Answ. Say if 100 principall yéeld 110, as well principal as

gaine, how much will 25 li. 10 shil. yéeld me? Multiply & diuide and you shall find 28 li. 1 s. Then say, if 10 yards $\frac{2}{3}$ do yéeld me 28 li. 1 s. as well principall as gaine, how much shal 2 $\frac{1}{4}$ yéeld me? Multiply and diuide and you shall find 5 li. 18 s. 4 d. $\frac{1}{12}$, and for so much shal the 2 yards $\frac{1}{4}$ be sold, to gaine after 10 li, vpon the 100 li. of money.

$$\frac{\frac{100}{1} \times \frac{110}{1}.}{\frac{32}{10\frac{2}{3}} \times \frac{561}{28\frac{1}{10}}} \quad \frac{51}{25\frac{1}{2}.} \quad \frac{9}{2\frac{1}{4}.}$$

And although that in these questions of gaine and losse, sometimes ỹ first nũber is not like vnto the third number, that is to say, of the same denomination: for whereas one would say, if 20 s. gaine 2 s. what shal 50 li. gaine? or what shall 25 li. gaine &c. Or if 20 li. do gaine 2 li. what shall 25 shil. gaine? or what shall 27 shil. $\frac{1}{2}$ gaine?

gaine: Yet the same doth not proue that the rule is therefore false. For if 20 s. do gaine 2 s. 20 li. shall gaine 2 li. and 20 d. shall gaine 2 d. likewise 20 crownes, shal gaine 2 crownes, & so of al other. Therfore it is to be vnderstood, that the first number of the rule of thrée in these reasons, is purposed to bee semblable or like to the third in quality or name.

When one Marchant selleth wares to another, and he giueth to the buyer 2 vpon 15: how much shal ỹ buyer gaine vpon the 100, after the rate:

Answ. First adde 2 vnto 15, and they are 17, then say if 15 giue 17, what shall 100 giue: Multiply and diuide and you shall find 113 $\frac{1}{3}$ so the buyer getteth after the rate of 13 $\frac{1}{3}$ vpon the 100.

15: | 17: | 100:

4 If one northren dozen cost me 3 li. 5 s. I sell ỹ same again for 3 li. 12 s. 6 d. how much do I gaine vpon the pound of money after the rate: Ans.

Say if 3 li. $\frac{1}{4}$ do giue 3 li. $\frac{5}{8}$ what shall $\frac{20}{1}$ giue? put the whole number into their broke & you shall haue $\frac{13}{4} \times \frac{29}{8}$ $\frac{20}{1}$ then multiply 4 times 29, by 20: & therof commeth 2320: for your number ý is to be diuided, likewise multiply 13 times 8, 1 time: and thereof cõmeth 104. Then diuide 2320, by 104 and you shall find 22 s. $\frac{4}{13}$. So I shall get 2 s. $\frac{4}{13}$ vpon 20 s. or vpon the pound of money.

$$\frac{13}{3\frac{1}{4}} \times \frac{29}{3\frac{5}{8}} \quad \frac{20}{1}$$

5. If a yard of cloth cost me 7 s. 8 d. and afterward I sel of the same cloth 13 yards $\frac{1}{4}$ for 4 li. 13 s. 4 d. I would know whether I do win or lose, and how much vpon the 100 li. of mony: Answer. Sée first at 7s. 8 d. the yard what the 13 yardes $\frac{1}{4}$ shall cost, and you shall find 5 li. 1 s. 7 d. And I sold the same but for 4 li. 13 s. 4 d. so that I do lose vpon ý 13 yards $\frac{1}{4}$, the sum of 8 s. 3 d. Then if you wil know how

much

much is lost in the 100: Say by the rule of three, if 5 li. 1 s. 7 d. do lose 8 s. 3 d. what will 100 li. lose? First, put 1 s. 7 d. into the part of a li. and it wil be $\frac{19}{240}$. Likewise put 8 s. 3 d. into the part of a li. & it is $\frac{33}{80}$. Then will your numbers stand thus: $5\ \frac{19}{240} \times \frac{33}{80}\ \frac{100}{1}$, reduce the whole into his broken, & then multiply and diuide, so you shall find 8 li. $\frac{11}{97}\ \frac{84}{52}$ which fraction is worth 2 shil. 5 d. $\frac{1}{12}\ \frac{69}{99}$, and so much is lost in the 100 li. of money.

$$\frac{1219}{5\ \frac{19}{240} \times \frac{33}{80}\ \frac{100}{1}}$$

6. More, if 12 yards $\frac{1}{2}$ of scarlet, bee sold for 30 li. 15 s. vpon the which is gained after the rate of 11 $\frac{1}{2}$ vpon the 100: I demaund what the yarde did cost at the first? Answ. from 30 li. 15 s. subtract his $\frac{11}{110}$ part which is 3 li. 1 s. 6 d. and there resteth 27 li. 13 s. 6 d. the which number multiplyed by 2 bringeth 55 li. 7 s. of the which number take the $\frac{1}{5}$, which is 11 li. 1 s.

and

and 4 d. $\frac{4}{5}$. Then take againe the $\frac{1}{5}$ of the ſaid 11 pound, 1 ſhilling 4 d. $\frac{4}{5}$, which is 2 li. 4 ſhillings 3 pence, $\frac{9}{25}$. And ſo much did the yard coſt at the firſt penny.

30 *lib.*	15 *ſhil.*	0 d.
3.	1.	6.
27.	13.	6.
2.	0.	0.
55.	7.	0.
11.	1.	$4\frac{4}{5}$.
2 *lib.*	4 *ſhil.*	3 d. $\frac{9}{25}$.

7 Woꝛꝛe, if 15 yards $\frac{3}{4}$ of ſcarlet, doe coſt me 32 li. 13 s. 4 d. And I ſell the yarde againe foꝛ 2 li. whether do I winne oꝛ loſe, and howꝛ much in oꝛ vpon the pound of money.

Anſw. Loke what the 14 yards, $\frac{3}{4}$ are woꝛth at 2 li. the yard, and you ſhall find that they are woꝛth 31 li. 10 s. But they did coſt 32 li. 13 s. 4 d. ſo that there is loſt vpon the whole, 1 li. 3 s. 4 d. Then to know howꝛ much

much is loſt in the li. Say by the rule of three, if 32 li. $\frac{2}{3}$ do loſe 1 li. $\frac{1}{1}$, what will $\frac{1}{1}$ loſe? that is to ſay, what will 1 li. loſe? reduce the whole nũbers into their broken, and then multiply & diuide, ſo ſhall you find $\frac{21}{3\,8\,1}$ part of a li. Then multiply 21 by 240 d. becauſe ſo many pence are in a li. and diuide the product by 588, & you ſhall find 8 d. $\frac{3\,3\,6}{5\,8\,8}$. which being abbreuied, doe make $\frac{4}{7}$, and thus you ſee, that 8 d. $\frac{4}{7}$, is loſt in the li. of money.

$$\frac{98}{32\frac{2}{3}} \times \frac{7}{1\frac{1}{6}\ \ \frac{1}{1}}.$$

8. If 1 yarde of cloth of tiſſue, bee ſold for 3 li. 15 s. whereupon is loſt after the rate of 10 d. in the 100: I demaund what 12 yardes $\frac{1}{2}$ of the ſame tiſſue did coſt? Anſ. Adde vnto 3 li. 15 s. his owne $\frac{1}{10}$ part, which is 7s. 6 d. and all amounteth to 4 li. 2 s. 6 d. then loke what the 12 yardes $\frac{1}{2}$, will amount vnto, after 4 li. 2 s. 6 d. and you ſhal find that they will come

to

to 51 li. 11 s. 3 d. ſo much did the 12 yards ½ coſt.

3 li.	15 ſh.	0 d.		12		½.	
	7	6		4 li.	2 ſhi.	6 d.	
4 li.	2 ſh.	6 d.		48	00	0	
				1	10	0	
				2	01	3	
				51 li.	11 ſhi.	3 d.	

9. Moze, if I ſell one wilſhire white foz 6 li. 12 s̄. whereupon I do gaine after ẏ rate of 2 s̄. vpon the li. of money: that is to ſay, vpon 20 s̄. I demaund what 11 pæces of the ſame whites did coſt me? Anſw. From 6 li. 12 s̄. (which is 132 s.) you ſhall ſubſtract his $\frac{1}{11}$ part, that is to ſay, 12 s. and there will remaine 120 s. oz 6. li. Then ſée at 6 li. the cloth, what the 11 clothes are woꝛth, and you ſhall find that they are wꝛoth 66 li. And ſo much did the 11 clothes coſt.

132 ſhil.		11	
12 ſhil.		6	
120 ſhil.		66 li.	

10.

10 If I ſell 10 elles $\frac{1}{3}$ of Holland for 22 ſ. 9 d. whereupon I do loſe after the rate of 2 ſ. in the li. of money. I demand what the elle did coſt me? Anſw. Say by the rule of thrée, if 18 giue 20 ſ. what will 22 ſ. 6 d. giue? Multiply and diuide, and you ſhall find 25 ſ. Then diuide 25 ſ, by 10 $\frac{1}{2}$. and thereof commeth 2 ſ, 4 d. $\frac{4}{7}$. So much did the elle coſt.

$\frac{18}{1} \times \frac{20}{1}$. 22 $\frac{1}{2}$.

11 If I ſell one cloth for 5 li. where vpon I doe loſe after 10. in the 100. I demaund how much I ſhould loſe or gaine, in the 100, if in caſe I had ſold the ſame for 5 li. 10 ſ. Anſ. Say if 90 yéeld 100, how much will 5 li. giue? Multiply & diuide and you ſhall find 5 li. $\frac{5}{9}$. Then ſay againe by the rule of thrée, if 5 $\frac{5}{9}$ come to 5 $\frac{1}{2}$. what will 100 come to? Multiply & diuide and you ſhall find 99 li. which being ſubſtracted from a 100, there will remaine 1 l. & ſo much is loſt in the 100

The

Chap. 5.

Of lengths and breadthes of Tapiſtry, *and other clothes.*

1 IF a péece of Tapeſtrie bée 5 elles $\frac{3}{4}$ long, and 4 elles $\frac{2}{3}$ in breadth, how many elles ſquare doth the ſame péece containe? Anſwer. Multiply the length by the breadth, that is to ſay $5\frac{3}{4}$ by $4\frac{2}{3}$, and thereof will come 26 elles $\frac{1}{6}$, ſo many elles ſquare doth the ſame péece containe.

2 More, if a péece of tapiſtry do containe 32 elles ſquare, & the ſame being in length 6 elles $\frac{1}{4}$. I demaund how many elles in breadth the ſame péece doth containe? Anſwer. diuide 32 elles by $6\frac{1}{4}$, and thereof commeth $5\frac{3}{25}$. So many elles doth the ſame péece containe in breadth.

3 More, a péece of cloth being 13 yards $\frac{1}{3}$ in length, and 5 quarters $\frac{1}{2}$ a quarter in bredth, how many yards of $\frac{1}{3}$ and $\frac{1}{2}$ of one third broad, will the

ſame

ſame péece make? Anſw. See firſt by the 5 Reduction what part of a yard the $\frac{5}{4}$ and $\frac{1}{2}$ quarter be, and you ſhall find that they make $\frac{11}{8}$, which is one yard $\frac{3}{8}$. Then multiply 13 yardes $\frac{1}{3}$ by 1 yarde $\frac{3}{8}$, and you ſhall haue 18 yards $\frac{1}{3}$ in ſquare, the which you muſt diuide by $\frac{2}{3}$ and $\frac{1}{2}$ being reduced into one fraction by the fift Reduction: that is to ſay, by $\frac{5}{6}$ (becauſe $\frac{2}{3}$ and $\frac{1}{2}$ being brought into one fraction maketh $\frac{5}{6}$) and you ſhall find 22 yardes. So many yards of $\frac{2}{3}$ and $\frac{1}{2}$ broad doth the ſame péece containe.

4 More, a Marchant hath bought 4 yards $\frac{2}{3}$ of cloth, being fiue quarters and halfe one quarter broad, to make him a gowne, the which he will line throughout with black Say of $\frac{3}{4}$ of a yard broad. I demaund how much Say ye muſt buy? Anſw. Multiply the length of the cloth by the bredth, that is to ſay $4\frac{2}{3}$ by $1\frac{5}{8}$ (which is the fiue quarters $\frac{5}{2}$ a quarter) and therof commeth 7 yardes $\frac{7}{12}$, the which di-

uide

uide by ¼, and you ſhall find 10 yards ⅖. So many yards of Say muſt hée haue to line ỹ ſame 4 yards ⅖ of cloth being of 6 quarters, and ½ a quarter broade.

5 More at 6 l̄. 8 ſ. the elle ſquare what ſhall apéece of Tapiſtrie coſte me, which is 5 elles ½ long, and 4 els ¾ broad? Anſw. Multiply 5 ½ by 4 ¾, and thereof cõmeth 23 ells ⅜ ſquare: then ſay by the rule of thrée, if 1 elle ſquare coſt me 6 l̄. 8 ſ. what ſhall 23 ⅜ ells coſt? Multiply and diuide, and you ſhall find 7 li. 15 l̄. 10 ſ. ſo much the ſaid péece of Tapiſtry did coſt.

Or otherwiſe by the Rules of practiſe, take the ⅓ of 23 ⅜: and you ſhall find 7 li. 15 l̄. 10 ſ. as aboue is ſaid.

6 More a péece of Holland cloath containing 42 elles ⅓ Flemiſh, how many elles Engliſh doe they make? Héere you muſt firſt note, that 100 elles Flemmiſh, do make but 60 ells Engliſh, and ſo conſequently, 5 elles Flemmiſh, doe make but 3 elles Engliſh.

English. Therefore say by the rule of Three, if 5 elles Flemish doe make 3 elles English, how many elles English will 42 elles $\frac{2}{3}$ Flemmish make? Multiply and diuide, and you shall find 25 elles $\frac{3}{7}$ English, and so many elles English doth 42 ells $\frac{2}{3}$ Flemish containe: the like is to bee done of all others.

7 More, I haue bought a péce of Tapestrie being 5 elles $\frac{3}{4}$ long, and 4 elles $\frac{2}{3}$ broade of Flaunders measure, I demaund how many elles square it maketh English measure? Answe. First, forasmuch as 3 elles English are worth 5 elles Flemish, therefore put 3 elles English into his squar, in multiplying 3 by it selfe which maketh 9: likewise multiply 5 in it selfe squarly, and it wil be 25. Then multiply 5 $\frac{3}{4}$, which is ỹ length of ỹ péce by 4 $\frac{2}{3}$, which is the bredth, and therof cõmeth 26 elles $\frac{5}{6}$ square, then say by the rule of three, if 25 ells square of Flemish measure be worth

9 elles ſquare of Engliſh meaſure, what are 26 elles $\frac{5}{6}$ Flemiſh worth? Multiply and diuide and you ſhal find that they are worth 9 elles $\frac{3}{5}\frac{1}{0}$ ſquare of Engliſh meaſure.

8. More, at 3 s. 6 d. the elle Flemiſh, what is the Engliſh elle worth after the rate? Anſ. Firſt, ſay if 5 elles Flemiſh be worth 3 elles Engliſh, what is 1 elle Flemiſh worth? multiply and diuide, and you ſhall find $\frac{3}{5}$ of an Engliſh elle. Then ſay againe by the rule of Three, if $\frac{3}{5}$ of an Engliſh elle, be worth 3 s. 6 d. what is 1 Engliſh elle worth? multiply and diuide, and you ſhall find 5 s. 10 d. ſo much ſhall the Engliſh elle be worth.

9. More at 6 s. 8 d. the Flemiſh elle ſquare, what is ye engliſh elle worth? Anſwe. Say by the aforeſayd reaſon if 25 elles Flemiſh ſquare, be worth 9 ells ſquare Engliſh, what is 1 elle ſquare flemiſh worth? Multiply and diuide, & you ſhall find $\frac{9}{2}\frac{}{5}$ of a ſquare

Engliſh

English elle. Then say, if $\frac{9}{25}$ of an english elle be worth 6 s. 8 d. what is 1 square english elle worth: multiply and diuide, and you shall find 1 8 shil. 6 pence. $\frac{2}{9}$, so much shall one English elle square be worth.

Chap. 6.

Of the reducing of the Pawnes of Genes into Englisn yards.

Note that 100 pawns do make 26 yards, & 1 pawn is $\frac{13}{50}$ of a yard after the same rate, & 3 pawnes $\frac{11}{13}$ do make 1 yard.

Example.

1 I Haue bought 97 Pawnes $\frac{1}{2}$ of Genes velvet, and I wold know how many yardes they will make: Answere. Say by the rule of three, if 100 pawnes do make 26 yards, what wil 97 $\frac{1}{2}$ make: multiply and diuide, and you shall haue 25 yards $\frac{7}{25}$. So many yards do the 97 pawnes $\frac{1}{2}$ containe.

Or otherwise, take some other nu-

ber at your pleasure, as 25 pawnes which doe make 6 yards $\frac{1}{2}$, and then say by the rule of three, if 25 pawnes doe make 6 yards $\frac{1}{2}$, what will 97 $\frac{1}{2}$ Pawnes make? Multiply and diuide, and you shall find 25 yardes $\frac{7}{25}$ as before.

More, at 2 shillings 7 d. the pawne of Genes, what wil the English yard be worth after the rate? Answe. Say by the rule of three, if $\frac{13}{50}$ of an English yard be worth 2 shil: $\frac{7}{12}$. What is $\frac{1}{1}$ yard worth? Multiply and diuide, and you shall find 9 s. 11 d. $\frac{9}{13}$. So much is the English yard worth. Or otherwise multiply 100 pawnes which is 26 yards by 2 s. 7 d. & thers of commeth 258 s. 4 d. the which you must diuide by 26 yards, & you shall find 9 s. 11 d. $\frac{9}{13}$, as before.

3 If 257 Pawnes $\frac{1}{2}$ be worth 20 li. 16 s. 8 d. What is one yard worth after the rate? Anſ. Say by the rule of three, if 257 $\frac{1}{2}$ pawnes bee worth 20 $\frac{5}{6}$, what are 3 pawnes $\frac{1}{13}$ worth?

Multiply

Multiply and diuide, and you shall find $\frac{12}{40}\frac{10}{17}$ part of a pound, which is worth 6 s. 2 d. $\frac{0}{1}\frac{14}{3}$, and so much is one yard worth.

Chap. 7.
Of Marchandize sold by waight.

1. A T 9 d. $\frac{1}{2}$ the ounce, what is ỹ li. waight worth? Ans. Say if $\frac{1}{1}$ giue $9\frac{1}{2}$, what will $\frac{16}{1}$ giue? Multiply and diuide, and you shall find 12 s. 8 d. so much is the yard worth?

Or otherwise, by the rules of practise, for 6 pence, take the $\frac{1}{2}$ of 16, which is 8 s. then for 3 d. take the $\frac{1}{4}$ of 16 s. which is 4 s. Finally, for the halfe pence, take 16 ob. which are 8 d. then adde all these numbers together and you shall find 12 s. 8 d. as before.

3. More, at 10 d. $\frac{1}{2}$, the ounce: what are 112 li. waight worth after ỹ rate? Answe. Reduce 112 li. into ounces, in multiplying 112 li. by 16 ounces, & you shal haue 1792 ounces: thẽ say

by the Rule of 3, if $\frac{1}{7}$ × 10 $\frac{1}{2}$. $\frac{17}{2}$ Multiply and diuide, and you ſhall find 18816 d. which doe make 78 li. 8 s. and ſo much are the 112 li. worth after 10 d. $\frac{1}{2}$ the ounce.

4. At 12 s. 8 d. the li. waight, what is the ounce worth? Anſwe. Put 12 s. 8 d. into pence, and you ſhall haue 152 pence: then ſay by the rule of 3, if 60 ounces coſt 152 pence, what ſhal 1 ounce coſt? multiply and diuide, and you ſhall find 9 pence $\frac{1}{2}$, ſo much is the ounce worth.

Or otherwile, take the $\frac{1}{4}$ of 12 s. 8 d. for 4 ounces, and thereof commeth 3 s. 2 d. then for one ounce, take the $\frac{1}{4}$ of 3 s. 2 d. and you ſhall haue 9 d. $\frac{1}{2}$ as before.

5. At 32 li. 10 s. the quintal, that is to ſay, the 100 li. waight: what is 1 li. waight worth after the ſame rate? Anſwe. Put 32 li. 10 s. all into ſhil. and you ſhall haue 650 s.

Then ſay by the rule of three, if 100

giue

giue 650, what wil I giue? Multiply and diuide, and you ſhall find 6 ſ. 6 d. ſo much is the li. worth.

6. If one pound waight of Saffron do coſt me 18 ſ. 8 d. what ſhall 355 l. 10 ounces coſt me by the ſame price? Anſwer. Say by the rule of three, if $\frac{1}{1} \times 18\frac{2}{3}$. $355\frac{5}{8}$ Multiply and diuide, and you ſhall find 331 li. 18 ſhi. 4 d. ſo much are the 355 li. 10 ounces worth.

Breefe Rules of waight.

WHo that multiplyeth the pence that 1 poũd waight is worth, by 5, and diuideth the product thereof by 12, he ſhall find how many pounds in money the quintall is worth, that is to ſay, how much the 100 pound waight is worth.

And contrariwiſe he that multiplieth the pounds of money that the 100 li. waight is worth by 12, and diui-

deth the product by 5, shall find how many pence the Pound waight is worth.

Example.

At 17 pence the pound waight, what is the 100 pound waight worth?

Anſ. Multiply 17 by 5, and thereof cõmeth 85, diuide the same by 12, and you shall find 7 pound $\frac{1}{12}$ in money, which $\frac{1}{12}$ is worth one shilling & eight pence. So much is the 100 li. waight worth.

More, at 13 li. the 100 li. waight, what is one pound waight worth?

Anſ. Multiply 13 by 12 and thereof commeth 156: the which diuide by 5, and you shall find 31 li. $\frac{1}{5}$, which is 2 s. 7 d. $\frac{1}{5}$, and so much is one li. waight worth.

The like is to be done of yards, elles or of any other measure, when we reckon but 5 score to the hundred.

Briefe Rules for Measure.

Who that multiplyeth the pence that

one

one elle is worth, by 2. And diuideth the product by 4, hée shall find how many pounds in money the 120 ells are worth, which 120 elles we count but for a Hundred in this place, because of worke, which measure is vsed for Canuas onely.

Or otherwise, if you diuide the pennies, that one elle is worth, by 2: you shall haue in your quotient ỹ pounds that the said 120 ells are worth, and if any thing remaine, they are parts of a pound.

And contrariwise, he that multiplieth the pounds in money that the 120 elles are worth, by 4, and diuideth ỹ of=come by 2, shall find how many pence the elle is worth.

Or otherwise, if you multiply the pounds that 120 elles are worth, by 2, you shall find in the product how many pennies one elle is worth.

Example.

At 10 pence the elle, what are 120 elles worth? Answe. Multiply 10 d. by

by 2, and thereof commeth 20. The which diuide by 4, and you shall find 5 pound, so many pounds in money are 120 elles worth, at 10 d. the elle.

Or otherwise, diuide 10 penies by 2, and therof commeth into your quotient 5: which 5 doth represent 5 li. and so many pounds are the 120 ells worth, as before.

More, at 9 pound the 120 elles, what is one elle worth? Answere. Multiply 9 li. by 4, and thereof commeth 36, the which diuide by 2, and you shall find 18 d. so much is one elle worth.

Or otherwise, if you multiply 9 pounds, which is the price that the 120 elles are worth by 2, you shall haue in the product 18, which 18 doth signifie ỹ pennies that 1 elle is worth when the 120 elles doth cost 9 pound, as before.

The like is to be done of all maner of wares, which are sold after 120 for the Hundred.

Briefe Rules of our Hundreth waight here at *London*, which *is after* 112 *lib. for the C.*

WHo that multiplieth the d. that 1 li. waight is worth by 7, and diuideth the product by 15 shal find how many pounds in money the 112 li. waight is worth.

And contariwise, hee that multiplieth the pounds in money, that 112 li. is worth by 15, and diuideth the product by 7, shall find how many pence one li. waight is worth.

Example.

At 9 pence the pound waight, what is the 112 li. waight worth? Answ. Multiply 9 d. by 7, and thereof commeth 63, the which diuide by 15 and you shal find 4 li. $\frac{3}{15}$, which being abbreuied is $\frac{1}{5}$ of a pound, being worth 4 s. And thus the 112 li. is worth 4 pounds, 4 shillings, after the rate of 9 d. the li.

At

At 8 li. the 112 li. waight, what is 1 li. waight woꝛth? Anſwe. Multiply 8 li. by 15. and therof cõmeth 120 the which diuide by 7 and you ſhall find 17 ß. $\frac{1}{7}$, ſo much is 1 li. waight woꝛth when the 112 li. is woꝛth 8 pounds.

Chap. 8.

Of Tares and allowances of Marchandize *ſold by waight.*

AT 112 li. the 100 ſuttell, what ſhall 987 li. ſuttell bée woꝛth? In giuing 4 pound waight vpon euery 100 foꝛ tret? Anſwer. Adde 4 li. vnto 100 and you ſhall haue 104. Then ſay by the Rule of thꝛée, if 104 be woꝛth 112 li. what are 987 pound waight woꝛth? Multiply and diuide and you ſhall find 113 li. $\frac{21}{26}$ which is woꝛth 17 ß. 8 ð. $\frac{4}{13}$. So much ſhall the 987 li. waight be woꝛth.

104. | 12. | 987.

2 At 6s.8d. the pound waight, what shal 345 li.½, be worth in giuing 4l. waight vpon euery 100 for the tret. Answe. See first by the rule of three, what the 100 poũd is worth saying, If $\frac{1}{1} \times 6\frac{2}{3}$. $\frac{100}{1}$. Multiply and diuide, and you shall find 33 li. ⅓, then adde 4 lt. vnto 100 and they are 104 then say againe by the rule of three, if 104 li. bee sold for 33 li. ⅓, for how much shall 345 li. ½ be sold: Multiply and diuide, & you shall find 110 li. 14 s. 8 d. $\frac{1}{13}$. For so much shall the 345 ½ bee sold, at 6 s. 8 d. the pound in giuing 4 vpon the 100.

3 More, if 100 li. be worth 36s. 8d. what shall 780 li. be worth, in rebating 4 li. vpõ euery 100, for tare and cloffe. An. multiply 780 by 4, & therof cõmeth 3120. The which diuide by 100, and you shall haue 31 li. $\frac{1}{7}$: abate 31 $\frac{1}{7}$ from 780 and there will remain 748 $\frac{4}{7}$. Then say by the rule of three, if $\frac{100}{1}$ do cost 36 $\frac{2}{3}$. what will 748 $\frac{4}{7}$ cost after the rate: Multiply & diuide so shall

ſhall you find 274 ℔. 6 ℥. $\frac{18}{115}$, & ſo much ſhall the 780 li. coſt, in rebating 4 li. vpon euery 100, for Tare & Cloſſe.

4. More, whether he doth loſe more that giueth 5 li. vpon the 100, or hée that rebateth 5 li. in the 100 for tare and cloſſe? Anſwe. Firſt note, that hée which giuith 5 li. vpon the 100. giueth 105 for 100: and he which rebateth 5 li. in the 100, giueth the 100 for 95. Therefore, ſay by the Rule of thrée, if 105 be giuen for 100, for how much ſhall the 100 be giuen? Multiply and diuide, and you ſhall find 95, $\frac{5}{21}$, and hée which rebateth 5 in the 100 maketh but 95 of a 100: ſo that he loſeth 5 in the 100, and the other which giueth 5 vpon the 100, loſeth but 4 $\frac{16}{21}$, vpon the 100. Thus you may ſée that hée which rebateth 5 in the 100 loſeth more by $\frac{5}{21}$ in the 100, then the other which gaue 5 vpon the 100 for Tare and Cloſſe.

5 If 100 li. of Allom doe coſt mée

26 s. 8 d. how shall I sell ỹ li. waight to gaine after the rate of 10 vpon the 100? Answe. Put 26 s. 8 d. all into pence, and you shal haue 320 d. Then say by the rule of thrée, if 100 giue a 110, what shall 320 giue? Multiply 320 by 110 and diuide the product by 100, and you shall find 352 d. Then say againe, if 100 li. be worth 352 d. what is 1 li. worth? Multiply and diuide, and you shal haue 3 d. $\frac{52}{100}$: which $\frac{52}{100}$ is worth $\frac{1}{2}$, and $\frac{1}{25}$ of $\frac{1}{2}$. That is to say, the ponnd waight shall be worth 3 d. $\frac{1}{2}\frac{1}{25}$ of a halfe penny, in gaining 10 vpon the 100.

6. If one pound waight do cost me 6 s. 10 d. and I sell the same for 7 s. 2 d. I demand how much I shal gaine vpon the 100 li. of money after the rate? Answ. Say by the rule of thrée if $6\frac{5}{6}$ yéeld $7\frac{1}{6}$: what will $\frac{100}{1}$ yéeld. Put the whole nũbers into their broken, thẽ multiply and diuide, and you shal find $104\frac{36}{41}$, from the which subtract 100, and there resteth 4 li $\frac{36}{41}$ so much

much is gained vpon the 100 pound of money after the rate.

7 More, If one pound doe coſt me 5 s.4d.and I ſell the ſame againe for 4 s. 9 d. I demaund howe much I ſhall loſe vpon the 100 pound of money: Anſ. Say, if 5 $\frac{1}{3}$, do giue but 4 $\frac{3}{4}$ what ſhal $\frac{16}{1}$ giue: Put the whole number into their broken, then multiply and diuide, and you ſhall finde 89 $\frac{1}{16}$, the which you muſt ſubſtract from a 100, and there will remaine 10 li. $\frac{15}{16}$, ſo much is loſt vpon the 100 li. of money.

8 More, if the lt. waight do coſt me 3 s̄. 2 d.and I ſell it againe for 4 s̄.4d how much ſhall I gaine vpon 20 s̄: Anſ. Say if 3 $\frac{1}{6}$ giue 4 $\frac{1}{3}$, what ſhal $\frac{20}{1}$ giue: Multiply and diuide, and you ſhall find 27 s. $\frac{7}{19}$, from the which abate 20 s.and there wil remaine 7 s̄. $\frac{7}{19}$ which is 4 d. $\frac{8}{19}$, and ſo much is gained vpon the pound of money, that is to ſay, vpon 20 s̄.

9 If the pound waight do coſt me 4 s.4 d. and I ſell it again for 3 s.2 d. I demaund how much I ſhall loſe in the pound of money: that is to ſay in twenty ſhillings. Anſ. Say if $4\frac{1}{3}$ giue but $3\frac{1}{2}$, what wil $\frac{20}{1}$ giue? Multiply and diuide, and you ſhal find 14 s. $\frac{8}{11}$, the which you muſt abate from 20 s. and there will remaine 5 s. $\frac{3}{11}$ which $\frac{3}{11}$ is worth 4 s. $\frac{8}{11}$ of a penny, and ſo much is loſt vppon the pound of money.

Chap. 9.

Of certäine queſtions, done by the double rule, and alſo by the Rule *of three compoſed.*

10 A Marchant hath ſold wines for the ſum of 300 pounds, and he hath gäined therin after 10 l. vpon the 100 li. The queſtion is to know, how much hée gained in all? Anſwe. Say by the rule of thrée, if a 110 li. do gaine 10 li. what will 300 li. gaine? Multiply and diuide, & you

ſhall find 27 li. $\frac{5}{11}$, and ſo much hath he gained in all.

11 A Marchant hath bought a péece of Hampſhire Carſey containing 18 yards, for the price of 4 li. 10 s. The queſtion is to know, how many yards hée ſhall ſell for 33 s. 4 d. to gaine 20 s. in the whole péece: Anſ. Adde 20 s. vnto 4 li. 10 s. and they make 5 li. 10 s. Then ſay by the rule of thrée, if 5 li. $\frac{1}{2}$ do yéeld me 18 yards what will 1 li. $\frac{2}{3}$ yéeld: multiply and diuide, and you ſhall find 5 yardes, $\frac{5}{11}$. And ſo many yards ſhall he ſell, to gaine 20 s. in the whole péece.

12 A Marchant hath ſold Sugars for the ſumme of 600 li. ready mony and he hath gained in the whole, the ſumme of 60 li. The queſtion is, to know how much hee hath gained vpon the 100 li. Anſwere. Firſt you muſt ſubſtract 60 li. from 600 li. and there will remaine 540 li. Then ſay by the rule of thrée, if 540 li. do gaine

60 li. what will 100 li. gaine? Multiply and diuide, and you ſhal find 11 li $\frac{1}{9}$. And ſo much had he gained vpon the 100 li.

13 More, if 1 li. waight of maces doe coſt me 5 s. 10 d. and afterward I doe ſell the ſame for 6 s. the li. to be paid for it at the end of 3 monethes: I demaund how much I ſhall gaine vpon 100 li. in 12 monethes after the rate? Anſw. Say by the firſt part of the rule of three compoſed: if 5 s. $\frac{5}{6}$ in $\frac{3}{1}$ moneths doe gaine $\frac{1}{6}$ of a ſhilling, which is 2 d. what $\frac{100}{1}$ li. gaine in $\frac{12}{1}$ moneths? multiply and diuide, and you ſhal find 11 li. $\frac{3}{7}$. And ſo much ſhall I gaine in 12 moneth, after the rate.

14 More, if 1 peece of Carſey do coſt me 35 s. for what price may I ſell ȳ ſame to be paid for it at the end of 3 moneths, ſo that I may gaine therby after the rate of 10 li. vpon the 100 li in 12 moneths? Anſwe. Say by the

firſt part of the Rule of thrée compoſed if 100 pounds in 12 moneths doe gaine 10 li. what wil 36 s. gaine in 3 moneths: Multiply and diuide, and you ſhall find $\frac{10 \times 0}{120}$ of a ſhilling, the which being abbreuied, doth make $\frac{9}{10}$ of a ſhilling, which is worth 10 d. $\frac{4}{7}$. the ſame you muſt adde with 36 s. and then you ſhall haue 36 s. 10 d. $\frac{4}{7}$ And for that price, I muſt ſell the péece of Kerſey for to gaine therein 10 li. vpon the 100 li. in 12 months, and giuing 3 moneths time for the payment.

15 More, if 6 yards of Northerne Carſey doe coſt mee 8 s. and I ſell 4 yards of the ſame Carſey for 6 ſhil. I demaund whether I gaine or loſe, and how much vpon a 100 li. of money: Anſwere. Firſt you muſt ſéeke what the 4 yards of Carſey did coſt: ſaying by the rule of thrée, if 6 yards doe coſt 8 ſhillings, what wil 4 yards coſt: multiply and diuide, and you ſhal find 5 s $\frac{1}{3}$. and ſo much did the ſaid

4 yards coſt, therfore abate the ſame $5\frac{1}{3}$ from 6 s. and there will remain $\frac{2}{3}$ of a ſhilling, which $\frac{2}{3}$ is gained in the ſame 4 yardes of Carſey. Then ſay againe by the rule of thrée, if $5\frac{1}{3}$ doe gaine $\frac{2}{3}$: what will $\frac{10}{3}$ gaine: multiply and diuide, and you ſhall find 12 and $\frac{8}{16}$, which $\frac{8}{16}$ beiug abbreuied is $\frac{1}{2}$. Therefore it appeareth that I ſhall gaine 12 li. $\frac{1}{2}$ vpon the 100 li. in ſelling 4 yards of the ſaid Carſey for 6 ſhillings.

16. Wore a Marchant hath bought a péece of Damaske which coſt him 8 s. the yard ready money, and hée ſelleth the ſame againe to an other Marchant, for 10 s. the yard, but hée giueth two daies for the payment, ỹ is to ſay, 2 moneths for one halfe, and 5 moneths for the other $\frac{1}{2}$. The queſtion is to knowe, how much the ſaid firſt Marchant doth gaine vppon 100 li. in 12 moneths after the rate aforeſaid? Anſw. You muſt adde the 2 moneths and the 5 moneths both

together, and they make 7 moneths, whereof you muſt take the one halfe, which is 3 moneths $\frac{1}{2}$. And at that time, the ſecond Marchant ought to haue paied the whole, at one entire paiment, and therefore ſay by the firſt part of the Rule of three compoſed. If $\frac{8}{1}$ s. in 3 $\frac{1}{2}$ moneths, doe gaine $\frac{3}{1}$ s. what will $\frac{100}{1}$ gaine in $\frac{12}{1}$ moneths? Multiply and diuide, and you ſhall find 85 li $\frac{5}{7}$. And ſo much doth the firſt Marchant gaine vpon the 100 in 12 moneths.

17 A Marchant hath bought veluet at 13 s. 9 d. the yard ready mony, and he ſelleth the ſame for 14 s. 3 d. the yard, to be paid $\frac{1}{3}$ part in ready mony, $\frac{1}{4}$ part at 3 moneths, and the reſt which is $\frac{1}{12}$, is to be paid to him at 5 moneths. The queſtion is, to know how much the firſt marchant doth gain vpon the 100 li. in 12 moneths, after the ſame rate? Anſ. See firſt at what time all the paiments ought to be paid at once: and for to know the

ſame

ſame, you muſt multiply euery ſeue-rall paiment, by ỹ time it ought to be paid, and ad thẽ together, then diuide the product by the totall ſumme of all the paiments being added together; And your quotient will ſhew at what time al ỹ paiments ought to be paid at once, as in ỹ former exãple, $\frac{1}{3}$ part in ready money is not multiplyed by any time, becauſe it is paid preſẽtly, then $\frac{1}{4}$ part being multiplyed by 3 moneths maketh $\frac{3}{4}$ of a moneth, and the reſt being $\frac{5}{6}$ multiplyed by 5 mo-neths bringeth $2\frac{1}{12}$, then adde $\frac{3}{4}$ and $2\frac{1}{12}$ together, and they make 2 mo-nethes $\frac{5}{6}$, the which is the iuſt time that all the paiments ought to be paid at once. And therefore ſay by the firſt part of the rule of thꝛée compoſed. If $13\frac{1}{2}$ in 2 moneths $\frac{5}{6}$ doe gaine $\frac{3}{4}$ of a pound, what will 100 li. gaine in 12 moneths after the rate: multiply and diuide, and you ſhall find 23 li. $\frac{09}{17}$. And ſo much doth hee gaine vpon the 100 li. in 12 moneths.

18. A marchant hath bought fuſſeãs which coſt him 22s. 6d. the péce ready money, and he will ſell the ſame at 24s. ỹ péce. The queſtion is to know what time hee ought to giue for the payment of ỹ ſame, to the end he may gaine after 9 li. vpon the 100 li. in 12 moneths? Anſwer. Say if 22 $\frac{1}{2}$ doe gaine 1 $\frac{1}{2}$: what will 10 $\frac{0}{1}$ gaine? multiply & diuide, & you ſhall find 6 $\frac{2}{3}$ of gaine. Then ſay againe by the rule of thrée, if $\frac{2}{3}$ of gaine do requíre $\frac{12}{1}$ what will 6 $\frac{2}{3}$ of gaine require? multiply & diuide, & you ſhall find 8 $\frac{8}{9}$, which is 8 moneths & $\frac{8}{9}$. And ſo long time, ought he to giue, to gaine after the rate of 9 li. vpon the 100 li. in 12 moneths.

19 A marchant hath bought a péce of Satten being in length 20 yards which did coſt him 12 pounds and 10 ſhil. ready mony. I demand for what price he ſhall ſell the yard, to be paid at the end of 2 moneths, ſo ỹ he may gaine after the rate of 10 li. vpon the 100 li. in 12 moneths? Anſwer. Hée

firſt

firſt what the yard did coſt him at the firſt, ſaying by the rule of thrée, if 10 yards coſt 12 li. 10 ſhil. what will 1 yard coſt? multiply and diuide, & you ſhall find 12 ſhil. and 6 d: Then ſay againe by the rule of Thrée, if 12 moneths do giue me 10 li. what will 2 moneths giue? Multiply and diuide, and you ſhall find 1 li. $\frac{2}{3}$. Adde therefore the ſayd 1 $\frac{2}{3}$ vnto 100 and they are 101 $\frac{2}{3}$. Say therefore once againe by the rule of thrée, if $\frac{10}{1}$ do giue mée 101 $\frac{2}{3}$ what will 12 $\frac{1}{2}$ giue? multiply and diuide, and you ſhall find 12 ſhil. & $\frac{17}{24}$ which is worth 8 d. $\frac{1}{2}$, & for 12 s. 8 d $\frac{1}{2}$, muſt he ſell the yard of Satten giuing 2 moneths time for the payment to gaine after the rate of 10 li. vpon the 100 li. in 12 moneths.

20. More if 1 li. waight of Sinamon do coſt me 8 s. ready money, for what price ſhall I ſell 100 li. waight of the ſame, to bee paid the $\frac{1}{4}$ at 1 moneth & the reſidue at the end of 3 moneths, ſo that I may gaine after 9 li. vpon

the

the 100 li. in 12 moneths after the rate? Anſwere.

ſéke firſt in how	$\frac{1}{4}$.	$\frac{1}{1}$.	$\frac{1}{4}$.
long time, both	$\frac{3}{4}$.	$\frac{3}{1}$.	$2\frac{3}{4}$.
the Paynents			$2\frac{1}{2}$ *moneth.*

ſhould bée made at once. The which to doe, you muſt multiply each paimẽt of money, by ỹ time when it ought to be payd, that is to ſay, you muſt multiply the firſt paynent which is $\frac{1}{4}$ part by $\frac{1}{1}$ moneth & therof cõmeth $\frac{1}{4}$ of a moneth. Likewiſe you muſt multiply the next payment which is $\frac{3}{4}$ by 3 months & therof will come 2 moneths $\frac{1}{4}$. Then adde $\frac{1}{4}$ of a moneth, and 2 moneths $\frac{1}{2}$ both together, and they make 2 moneths $\frac{1}{2}$ which is the time that both the payments ought to be paid at once. Thẽ ſay by the rule of thréé, if 12 months do giue 9 li. what will 2 moneths $\frac{1}{2}$ giue? Multiply and diuide, and you ſhall find 1 $\frac{7}{8}$, ſay againe by the Rule of thréé. If 1 li. waight doe coſt méé 8 ſ. what will 100 li. coſt? Multiply and diuide, and you ſhall find 40 li.

Then

Then ſay once againe, if $\frac{10}{1}$ to giue 101 $\frac{7}{8}$, what wil $\frac{40}{1}$ giue? Multiply and diuide, and you ſhall find $40\frac{3}{4}$. And for 40 li. 15 s. I muſt ſell 100 li. waight of Sinamon, to be paid at y 2 ſeuerall times aforeſaid, to gaine therein after the rate of 9 li. vppon 100 li. in 12 moneths, as by example aforeſaid.

20 When the quarter of wheat doth coſt 6 s. 8 d. y loafe of bread weighing 20 ounces, is ſold for a halfe penny. I demand that if the quarter of wheat did coſt ten ſhillings, for how much ſhall the loafe of bread be ſold, that weigheth 16 oũces? you ſhal anſwer by the firſt part of the Rule of Three compoſed, which is mentioned in the ſecond Chapter of the third part of this booke, where you muſt ſay by the ſame firſt part of the rule of 3 compoſed, if $6\frac{2}{3} \mid \frac{20}{1} \mid \frac{1}{2} \mid \frac{10}{1} \mid \frac{16}{1}$.

Then multiply the firſt number by the ſecond, and the product thereof ſhalbe your diuiſors. Likewiſe multi-

ply

ply the other thrée numbers the one by the other, and the product thereof ſhall be your diuidend: as thus, firſt multiply $6\frac{2}{3}$ by $\frac{20}{1}$, and thereof commeth $\frac{40}{3}$ for your diuiſor, then multiply $\frac{1}{2}$ by $\frac{10}{1}$ and the product thereof by $\frac{16}{1}$, ſo you ſhall haue $\frac{160}{2}$ for your nũber that is to be diuided, then diuide $\frac{160}{2}$ by $\frac{40}{3}$, and therof commeth $\frac{420}{800}$, the which being abbreuied bringeth $\frac{3}{7}$ of a peny: and for that price muſt ỹ loafe of bread be ſold, which weigheth 16 ounces, when the quarter of wheat is worth 10 ſhillings.

Or otherwiſe by the Rule of thrée at two times. Firſt ſay, if $\frac{20}{1}$ ounces giue $\frac{1}{2}$, what wil $\frac{16}{1}$ ounces giue: multiply and diuide, and you ſhall find $\frac{2}{5}$ of a peny. Then ſay againe, if $6\frac{2}{3}$ doe giue me $\frac{2}{5}$, what will $\frac{10}{1}$ giue: Multiply and diuide, and you ſhall find $\frac{3}{7}$ of a peny, as afore is ſaid.

21. When ỹ cariage of one hundreth waight of marchãdiſe 50 miles, doth coſt 5s. what ſhall the cariage of 500 waight

waight coſt me for 16 mile? Anſwe. By the firſt part of the rule of 3 compoſed, ſaying; if 100| 50| 5| 500| 16. Multipty 100 by 50, the product will be 5000, which ſhall be your diuiſor. Then multiply 5 times 500 by 16, & thereof commeth 40000 for your diuidend. Therefore diuide 40000 by 5000, and you ſhall find 8 s. ſo much ſhall coſt the carriage of 500 waight 16 miles.

Or otherwiſe by the double rule of three, that is to ſay, by the rule of 3 at two times: firſt ſay, if 50 miles doe pay 5 s̄. what ſhal 16 miles pay? multiply and diuide, and you ſhall find 1 s̄ $\frac{3}{5}$. Then ſay againe, if 100 waight doe coſt mee 1 s̄. $\frac{3}{5}$, what ſhall 500 waight coſt? Multiply and diuide, & you ſhall find 8 s. as before.

22 When the carriage of 100 poũd waight of marchãdize 84 miles doth coſt me 6 s̄. how many miles may I haue 64 poũd waight, caried for 3 s. 4 d. Anſw. by the ſecond part of the

Rule

Rule of Thrée compoſed, and ſay if $\frac{200}{1}$ | $\frac{84}{3}$ | $\frac{6}{1}$ | $\frac{64}{1}$ | $3\frac{1}{3}$.

Then multiply the fourth number $\frac{64}{1}$, by the third number $\frac{6}{1}$ and thereof commeth $\frac{384}{1}$ for your diuiſor. Likewiſe multiply $3\frac{1}{3}$ by $\frac{100}{1}$, and by $\frac{84}{1}$, and you ſhal haue in the product $\frac{8400}{3}$ then diuide $\frac{8400}{3}$ by $\frac{384}{1}$, and you ſhal find 72 miles, and $\frac{11}{12}$ of a mile. So many miles ſhall the 64 li. waight be caried, for 3 ſhil. 4 d.

Otherwiſe by the rule of thrée, at two times: Firſt, ſay if 100 waight doe coſt me 6 d. what will 94 pound waight roſt? Multiply and diuide and you ſhal find 3 s. $\frac{21}{25}$. Then ſay if $3\frac{21}{25}$ be paid for 94 miles cariage: for how many miles ſhall 3 s. $\frac{1}{3}$ be paid? multiply and diuide, and you ſhall find 72 miles $\frac{11}{12}$ as before.

23 If 100 horſes, in 100 daies, do ſpend 180 quarters of oats: how many quarters of oates will 350 horſes ſpend in 150 daies? Anſw. By the firſt part of the rule of thrée compoſed you muſt multiply 180 times 350, by

150:

150: and diuide the product by 100 times 100: and you ſhall find 945 quarters. So many quarters of oats will 350 horſes ſpend, in 150 daies. Or otherwiſe by the rule of 3 at two times: Firſt ſay, if 100 daies do yéeld me 180 quarters of oats: what ſhall 150 daies yéeld: Multiply and diuide and you ſhall find 270 quarters: then ſay again, if 100 horſes do ſpend 270 quarters of oats how many quarters of oats will 350 horſes ſpend: Multiply and diuide, and you ſhall find 945 quarters, as before.

Chap. 10.
Of the Rule of Fellowſhip, without any time limited.

THe Rule of fellowſhip is thus, you muſt ſet down each mans ſum of mony that he laieth into company, euery one directly vnder the other, the which ſums you ſhall adde all together, and the totall ſumme

ſum of all their whole ſtockes being thus aſſembled ſhal be your common diuiſor, to the finding out of euery mans part of ẏ gaine. Then you ſhal multiply either ẏ gaine, or els ẏ loſſe which ſoeuer of them doth happen by each mans portiõ of money ẏ he laid in, and diuide the products by the ſaid diuiſor: ſo ſhall you haue in your quotient euery mans part of the gaine, if any thing be gained, or els of the loſſe if any thiug be loſt.

Example.

1 TWo Marchants haue laid their money in company together: The firſt laid in 500 li. The ſecond laid in 300 pound. and with trading they haue gained 64 li. I demaund, how much ech man ſhall haue of the ſame gaines according to the money that he laid in? Anſwere. Adde 500 and 300 both together, which are the parcels or ſumms that they both laid in, and thereof commeth 800 for your diuiſor: then ſay by the rule of three,

if

if 800 li. which is the whole stocke doe gaine 64 li. what shall 500 li. gaine: (which is the first mans money that hée laid in) multiply and diuide and you shall find 40 li. for the first mans part of the gaine: then say if 800 giue 64, what will 300 giue? Multiply and diuide, and you shall find 24 li. for the second mans part of the gaine.

500|
300| 800| 64| 500.
800

800| 64| 300.

Or otherwise, put 500 li. which is ỹ first mans money that he laid in, ouer the 800 li. which is the whole stock, & you shall haue $\frac{500}{800}$, which béeing abbreuied, do make $\frac{5}{8}$ and such part of ỹ gaine shall the first man take, that is to say $\frac{5}{8}$ of 64 li. which is 40 li. And consequently, by the same maner, the second shall take the $\frac{3}{8}$ of 64, which is 24 pound, for his part of his gaine, as

before.

5	00	3	00
8	00	8	00

2 Two Marchants haue companied together, the first laid in 640 li. and hée taketh $\frac{5}{8}$ parts of the gaine, I demannd how much the second Marchant layd in? Answere. Séeing that the firſt marchant taketh $\frac{5}{8}$ of ỹ gaine it followeth that the second marchãt must haue $\frac{3}{8}$, which is the reſt, & therfore say by the rule of thrée, if $\frac{5}{8}$ of the gaine which the first man taketh, did lay into the stocke $\frac{640}{1}$. How much shall $\frac{3}{8}$ of the gaine lay in, which is the second mans gaine? Multiply and diuide, and you shall find 384 li. so much ought the second man to lay into company.

3 Two Marchants haue companied together, the first man layd in 640 li. and the second hath laid in so much money for his part, that he must haue 60 li. for his part of 100 li. that they

haue

haue gained. I demaund how much the ſecond man did lay into company Anſwere. Séeing that the ſecond man taketh 60 li. of the gaine, it followeth that the firſt muſt haue the reſt of the 100 li. which is but 40 pound. Therfore ſay by the rule of Thrée, if 40 li. doe lay in 640 li. what ſhal 60 li. lay in? Multiply and diuide and you ſhal find 960 li. ſo much did the ſecond Marchant lay in.

4 Two Marchants haue companied together, The firſt layd in 83 li. 6 ſ. 8 d. The ſecond laid in 170 duckets, and they haue gained 100 li. of the which the firſt man muſt haue 60 li. I demaund what the Ducket was worth?

Anſwe. Séeing that the firſt man muſt haue 60 li. it followeth that the ſecond muſt haue 40 li. Therfore ſay by the rule of Thrée, if 60 li. of gaine that the firſt man taketh, did lay in 83 li. 6 ſ. 8 d. principall, how much ſhall 40 li. gaine put in, which is the gaine

that the second man taketh, multiply and diuide, and you shall find 55 li. $\frac{5}{9}$, so much are ỹ 170 Duckets worth Then put 55 li. $\frac{5}{9}$ into shillings, and you shall haue 1111 s. $\frac{1}{9}$. So then for to know what the Ducket is worth, say by the rule of Three, if $\frac{170}{1}$, giue 1111 $\frac{1}{9}$, what will $\frac{1}{1}$ giue? Multiply and diuide, and you shall find 6 s̄.6 d̄. $\frac{22}{51}$, so much is the Ducket worth.

5 Two Marchants haue companied together, the second man laid in more by 30 li. then did the first man, & they gained 120 li. of the which the first man ought to haue 50 li. I demaund what each of them did lay in? Answ. From 120 li. abate 50 li. and there resteth 70 li. for the second mans part: so that by this meane the second man (because he laid in 30 li. more, than ỹ first man did) he taketh 20 li. more of ỹ gaine: & therfore say by the rule of three, if 20 li. gaine, did lay in 30 li. principall, how much shal 50 li. gaine lay in? Multiply and diuide, &

you

you shall find 75 li. so much did the first man lay in, and consequently the second layd in 105 li.

6 Two Marchants haue companied together, the second hath laid in twise so much as the first man did, and 10 li. more: and they haue gained 100 li. of the which, the first ought to haue 32 li. for his part: I demaund how much each of them did lay into company: An. If it were not for the 10 li. that the second man laid in more thã the first, hé should haue had but 64 li. of the gaine, which is the double of the first mans part. But because he laid in 10 li. more, hé hath therefore 4 pound more of the gaine, and therfore say by the rule of thrée, if 4 li. gaine did lay in 10 li. of principall (which was ouer & aboue the double of ỹ first mans layings in) what shall 32 li. of gaines lay in, which is the first mans part of the gaines that hé taketh: multiply and diuide, and you shall find 80 li. for the first mans laying in: and so consequently 170 li.

for

for the second mans portion that hée layd in.

7 Two Marchants haue companied together, and they haue gained 100 li. of the which the first must haue after the rate of 10 li. vpon the 100 li. & the second must haue after the rate of 15 li. vpon the 100 li. I demaund how much each of them ought to haue Answe. Put 10 li. for the first mans laying in, & 15 li. for the second mans laying in. Adde therefore 10 li. and 15 li. together, and they make 25 li. Then put 10 ouer 25, & it is $\frac{10}{25}$ which beeing abbreuied are $\frac{2}{5}$. Therefore he that taketh 10 li. vpon the 100 li. must haue the $\frac{2}{5}$ of the gaine, which is 40 li. Then put 15 ouer 25, and it is $\frac{15}{25}$ which beeing abbreuied are $\frac{3}{5}$: Therefore the second must haue $\frac{3}{5}$ of the 100 li. which is 60 li.

8 Two Marchants haue companied together, The first laid in 46 li. 18 s. and the second laid in 33 li. 2 s. so

they

they haue gaine 30 li. I demaund how much euery man shall haue for his part of the gaine? Answer. Adde 46 li. 18. s. & 33 li. 2 s. both together, and you shall find 80 li. for your common diuisor: then say if 80 li. which is al their stocke, do gaine 30 li. what wil 46 $\frac{9}{10}$ gaine? which is the money that the first man layd in? Multiply and diuide, and you shall find 17 li. 11 s. 9 d. for the first mans part of the gaine. Then say againe by the rule of three, if 18 li. doe gaine 30 li. what wil 33 li. $\frac{1}{10}$ gaine, which was the second mans money that hée layd in? multiply and diuide, and you shal find 12 li. 8 s. 3 d. for the second mans part of the gaine.

And after the same maner shall you do, in case that they were 3 or 4 marchants that wold company together. Adding all and euery of their sums of money (which they lay into the stocke) into one totall summe, which shal be yhu common diuisor: and then worke with the rest, as is taught in the for-

mer question of the rule of company.

Example.

9 Three Marchants haue companies together, the first laid in I know not how much: the second did put in 20 péeces of cloth: and the third hath laid in 500 Pound. So at the end of their company, their gaines amounted vnto a 1000 li. whereof the first man ought to haue 350 Pound, and the second must haue 400 pound.

Now I demaund, how much the first man did lay in, & for how much the 20 péeces of cloath were put into company.

Answer.

Seeing that the first, and the second Marchants must haue 750 li. for their part of the gaine. Then the third man must haue the rest of the 1000 li. which is 250 li. And therefore say by the rule of three, if 250 li.

gaine,

gaine, become of 500 li. principall, of how much shall come 350 li. gaine, which the first man taketh: multiply and diuide and you shall find 700 li. So much did the first man lay in: thē say if 250 li. gaine, become of 500 li. principall, of how much will come 400 li. which is the gaine that the second man taketh. Multiply and diuide, and you shall find 800 li. For that price were the 20 peces of cloth layd into company.

10 Three Marchants haue gained 100 li. the first must haue the $\frac{1}{2}$, the second must haue $\frac{1}{3}$, and the third must haue $\frac{1}{4}$. I demaund how much euery man must haue of the gaine? Answ. Reduce $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$, into a common denomination, after the order of the second reduction in Fractions, and you shall find $\frac{12}{24}$, for the $\frac{1}{2}$, $\frac{8}{24}$ for the $\frac{1}{3}$, and $\frac{6}{24}$ for the $\frac{1}{4}$: Then take 12 for the first mans laying in, 8 for the second mans laying in, and 6 for the third mans laying in. The which

three

thꝛée numbers bée ing added together, ſhall be your common diuiſoꝛ, & they do make 26. Then multiply 100 li. by 12, foꝛ the firſt man: then againe 100 li. by 8 foꝛ the ſecond: and laſt of all 100 li. by 6 foꝛ the third man. And diuide ẏ̄ pꝛoducts of euery multiplycation by 26. So ſhall you find 46 li. $\frac{2}{13}$ foꝛ the firſt mans part of the gaine 30 li. $\frac{10}{13}$ foꝛ the ſecond mans part: & 23 li. $\frac{1}{13}$, foꝛ the third mans part.

11 Two Marchants haue gained 100 li. The firſt muſt haue $\frac{1}{2}$ and 5 li. moꝛe, the ſecond muſt haue $\frac{1}{3}$ and 4 li. moꝛe, I demaund howw much each of them ſhall haue? Anſw. Firſt from 100 abate 5 and 4, which are 9, ſo there will remaine 91, then take the $\frac{1}{2}$ of 100 li, which is 50 li. foꝛ the firſt mans laying in. Likewiſe, take $\frac{1}{3}$ of 100 li. foꝛ the ſecond mans laying in, which is 33 li. $\frac{1}{3}$: Then adde 50 li. & 33 li. $\frac{1}{3}$ together, and you ſhall haue 83 li. $\frac{1}{3}$ foꝛ your common diuiſoꝛ: thē multiply 91 pound by 50, and diuide

by

by 83 1/3, and thereof commeth 54 li 3/5, vnto the which number adde 5, and all is 58 li. 3/5 for the first mans part of the gaine. Likewise multiply 91 by 33 1/3, and diuide by 83 1/3, and you shal find 36 li. 3/5, vnto the which adde 4, and you shall haue 40 li. 3/5 for the second mans part.

12 Two Marchants haue gained 100 li. The first must haue the 1/2 lesse by 4 pound, The second must haue 1/3 lesse by 2 Pound. I demaund how much each of them shall haue? Ans. Adde 4 and 2 with 100, & they make 106. Then take as before is said, 50 li. for the first man: and 33 1/3 for the second: and adde them both together, and they be 83 1/3, which shall be your diuisor. Then multiply 106 by 50, & diuide the product by 83 li. 1/3, so therof commeth 63 li, 3/5. From the which abate the 4 li. lesse that the first man taketh, and then is there remayning 52 li. 3/5 for his part. Likewise multiply 106 by 33 1/2, and diuide by 83 1/3,

and

and you ſhall find 42 li. $\frac{2}{7}$, from the which abate 2 pound leſſe, and there remaineth 40 li. $\frac{2}{5}$ for the ſecond mans part.

The Rule of Fellowſhip, with time.

THe money that euery man laieth in, muſt be multiplied by the time that it cõtinueth in company: and of that which commeth therof, you ſhall make their new layings in for each of them: and then multiply the gains by euery one of them ſeuerally, & the of-comes you ſhall diuide by all their new layings in added together, and then you ſhall haue proportionally, each mans part of the gaine according to his laying in.

Example.

1 TWo Marchants haue companied together, the firſt hath put in the firſt of Ianuarie, 450 pound, the ſecond did lay in the 2 of May, 750 pounds.

And

And at the yéeres end, they had gayned 100 li. I demand how much each of them shall haue of the gaine? Ans. Forasmuch as the first did put 450 li. the first of January, his money continued in company 12 moneths, & therfore multiply 450 by 12 moneths, & thereof commeth 5400 for his new laying in. And the second laid in his 750 li. but at the first day of May: so that his money remained in company but 8 Moneths. Therfore multiply his 750 li. by 1 & therof cõmeth 6000 for his new laying in. Then ad 5400 with 6000, and they make 11400 for your common diuisor. Then multiply 100 li. which is the gaines by 5400: and diuide the product by 11400, and thereof wil come 48 li. $\frac{7}{19}$ for the first mans part of the gaine. Likewise, multiply 100 by 6000: and diuide the product by 1140, & you shal find $52\frac{12}{19}$: and so much must the secõd man haue for his pãrt of the gaine.

2 Two Marchants haue companied together, the first hath laid in, the first

first of Januarie 640 li. The second can lay in nothing vntill the first of Aprill. I demaund how much he shall then lay in, to the end that hée may take halfe the gaine: Answe. Multiply 640 li. by 12 moneths, that his money abideth in company, and thereof will come 7680 li. for his laying in. And so much ought the second man to lay in, for because he taketh ½ of the gaine. But for that, that he putteth in nothing vntil the first of April his money can be in company no longer than 9 moneths. And therefore diuide 7680 by 9, and thereof will come 853 li. ⅓. So much ought the second Marchant to lay in the first of Aprill, to the end that he may take the one halfe of the gaines.

3 Thrée Marchants haue companied together, The first laid in the first of March 100 li. The second laid in the first of June so much money, that of the gaine, he must haue the ⅓ part: and the third layd in the first of Nouember

uember ſo much money, that of the gaines he muſt haue likewiſe $\frac{1}{3}$, and they continued in company vntill the next March following. I demaund how much the ſecond and the third Marchants did lay in: Anſ. Multiply 100 li. which the firſt man did lay in, by 12 moneths, that his money continued in company, and thereof commeth 1200 for his laying in, and ſo much ought the ſecond and the third Marchants each of them to lay in, becauſe they part the gaines by thirds. But for that, that the ſecond Marchãt layeth in nothing til the firſt of June, his money can bee in company but 9 moneths. Therefore diuide 1200 by 9 moneths, & thereof will come 133 $\frac{1}{3}$. And ſo much ought the ſecond marchant to lay in. Then, foraſmuch as the third Marchant did lay in nothing vntill the firſt of Nouember: his money abideth in company but ỹ ſpace of 4 moneths. Therefore diuide 1200 by 4, and therof commeth 300 li. And ſo much ought the third Marchant

chant to lay into company.

4 Three Marchants haue companied togeather, the first layd in, the first of January 100 Duckets. The secõd hath layd in 50 li. the first of March, and the third put in a Jewell, the first of July, and at the yéeres end, they had gained 400 crowns: of ỹ which the first Marchant must haue 50, Crownes, and the second must haue 80. I demaund what the Ducket was worth, and at what price the Jewell was valued, which the third Marchant laid in: Answer. The first mans money béeing 100 Duckets multiplied by 12 is 1230 Duckets by the rule aforesaid, and hee taketh 50 Crownes for the gaine: therefore say if 50 Crownes gaine bée come of 1230, which was his stocke, of how much shall come 80 Crownes gaine, that the second man taketh: Multiply and diuide, and you shall find 1920, for the second Marchants laying in. Then say againe, if 50 Crownes bée come

come of 1200 ſtocke, of how much ſhall come 270 Crownes, which the third man taketh of the gaine: multiply and diuide and you ſhal find 6480 for the third Marchants laying in. Then diuide 1920, which is the ſecond mans laying in, by 10 moneths that his money did continue in company and you ſhall find 192 Duckets, which are worth 50 li. becauſe hée layd in 50 li. Then diuide 50 li. (being firſt reduced into ſhillings by the ſaid 192 Duckets) and thereof will come 5 ſhillings 2 pence $\frac{1}{2}$. So much was the Ducket worth: Finally, diuide 6480, (which is the third mans laying in) by 6 moneths that his Jewell remained in company, and you ſhall find 1080 Duckets, and for that price was the Jewell put into company.

5 Three Marchants haue companied together: The firſt laid in the firſt of January 100 li. and the firſt of Aprill he hath taken backe againe 20 l.

The second hath laid in the first of March 60 li. and afterward hée did lay in more 100 li. the first of August. The third laid in the first of July 150 li. And the first of October he did take backe againe 50 li. And at the yéeres end, they found that they had gained 160 li. I demaund how much euery man shall haue of the gaine? Answe. Multiply 100 li. which the first man layd in by 12 moneths, and thereof commeth 1200 li. from that number abate 9 times 20 li. which are 180 for that which he did take backe againe: and there will remaine 1020, for the first mans laying in. Then multiply 60 which the second man laid in by 10, and you shall haue 600: vnto the which ad 5 times 100 li. for ỹ money hee laid in more the first of August, which are 500, so all amounteth to 1100 for ỹ 2 mans laying in. Afterwards multiply 150 pound, which the third man hath laid in, by 6 moneths, and thereof cõmeth 900, from the which number abate 3 times 50,

AND

and they are 150 for the money that hee did take backe againe, the firſt of October, ſo there will remaine 750, for the 3 mans laying in. Then proceed with the reſt, as is taught in the firſt queſtiõ of the rule of Fellowſhip with time in adding 1020, 1100 and 750 altogether, which ſhall be your diuiſor. Then multiply 160 li. which is the gaine by 1020, by 1100 and by 750: & diuide at euery time by your Diuiſor, that is to ſay, by al their layings in, added together, which is 2870: ſo you ſhall find 55 $\frac{248}{287}$ for the firſt man: 61 $\frac{93}{287}$ for the ſecond: and 41 $\frac{233}{287}$ for the third man.

6 Two Marchants haue companied together, The firſt hath layd in 960 pounds for the ſpace of 12 moneths, and hee ought to haue 8, pound vpon the 100 li. of the gaine. The ſecond hath laid in 1120 li. for the ſpace of 8 moneths, and he ought to haue after 12 pound vpon the 100 pound of the gaine.

And at the yéeres end, they haue gained 800 li. I demand how much each of them shall haue of the gayne? Answere. Multiply 960 that the first man did lay in by 12 moneths, & the product thereof multiply againe by 8, and you shal haue 92160, for the first mans laying in: thē multiply ỹ 1120 that the second hath laid in, by 8 moneths, and that which commeth thereof, you shall multiply againe by 12, & you shall find 107520, for the second mans laying in. Then procéed with the rest, as in the first question of the rule of Fellowship is declared, as in the last example I haue taught you and you shall find 369 li. $\frac{3}{13}$ for the first man: and 430 li. $\frac{10}{13}$ for the second man.

The Rule of Company, betweene Marchants, and their *Factors.*

NOte that the estimation of the body, or person of a Factor, is in

in such proportion to the stocke which the marchant laieth in, as ỹ gaine of the said factor is vnto the gaine of the marchant. As thus, if a marchant do deliuer into the hands of his Factor 200 li. to employ, and he to haue halfe the profit, the person of the said Factor shall be estéemed to be worth 200 li. And if the Factor doe take but the $\frac{1}{3}$ of the gaine, he should haue but $\frac{1}{2}$ so much of the gain as the marchant taketh which must haue $\frac{2}{3}$: wherfore the person of the Factor is estéemed but the $\frac{1}{2}$ of that which the marchant layeth in, that is to say, 100 li.

And if the Factor did take the $\frac{2}{5}$ of the gain, then the marchant shal take the residue, which are $\frac{3}{5}$ of the gaine: wherfore the gaine of the Marchant vnto that of the Factor, is in such proportion as 3 vnto 2. Then if you will know the estimation of the person of the Factor, say if 3 giue mée 2, what will 200 giue: Multiply 200 by 2, and diuide by 3, so you shall find $133\frac{1}{3}$. Or otherwise you must con-

sider that the Factor taketh the $\frac{2}{3}$ of that which the marchant taketh. And therfore take the $\frac{2}{3}$ of 200, & you shall find 133 $\frac{1}{3}$ as before: and so much is the person of the Factor estéemed to be worth.

8 And if the Marchant should deliuer vnto his Factor 200 li. and the Factor would lay in 40 li. and his person to the end hée might haue the halfe of the gaine: I demand for how much shall his person bée estéemed?
Answ. abate 40 li. from 200 li, and there will remaine 160 li. And at so much shall his person be estéemed.

And if the Factor would take the $\frac{2}{3}$ of the gaine, his person with his 40 pound shal be estéemed twise as much as the stock that the Marchant layeth in, which should haue put $\frac{1}{3}$ of ȳ gain for $\frac{2}{3}$ vnto $\frac{1}{3}$ is in double proportion. Therefore double 200 Pounds, and therof commeth 400 li. from ȳ which abate 40 li. and there wil remain 360 li. But if the Factor would take only

ly the $\frac{1}{3}$ of the gaine, that shall be but the $\frac{1}{2}$ of $\frac{2}{3}$ which the marchant taketh: and then the estimation of his person with his laying in should be estéemed but the halfe of ỹ which the marchāt layeth in: you must therefore take the $\frac{1}{2}$ of 200 li. which is 100 li. from the which you shall abate 40 pound, and the rest which is 60 li, is the estimation of his person.

9 If it so chance for to make traffick of 240 li. that the person of the factor should be in such wise estéemed that hée should haue but the $\frac{1}{4}$ of the gaine, and yet hée would haue the $\frac{2}{3}$ I demaund how much ready money he ought to lay in, besides his person? Answer. Séeing that his person gayneth the $\frac{1}{4}$, therefore all the whole laying in, which is 240 li. shal gaine the rest, that is to say ỹ $\frac{3}{4}$. Now because $\frac{3}{4}$, [illegible] the $\frac{1}{3}$ of $\frac{3}{4}$, therefore his person shal be estéemed the $\frac{1}{3}$ of al the laying in. Take then the $\frac{1}{3}$ of 240 li. and you shall haue 80 li. for the estimation of

his perſon, and for because that hée will haue halfe of the gaine, you ſhal adde 80 li. with 240 li. and thereof commeth 320 li. of the which take the halfe, which is 160 li. and from the ſame you ſhal abate the 80 li. & there will remaine other 80 li. which hée ought to lay in of ready money, & the Marchant muſt lay in the ouerplus, which amounteth to 160 li.

10 A Marchant hath deliuered to his Factor 1200 li. to gouerne them in the trade of marchandiſe vpõ ſuch condition, that he for his ſeruice ſhall haue the $\frac{1}{3}$ of the gaine, if any thing be gained, and he ſhall beare the $\frac{1}{3}$ of the loſſe, if any thing bée loſt: I demaund, for how much his perſon was eſtéemed? Anſw. Séeing that the Factor taketh the $\frac{1}{3}$ of the gaine, his perſon ought to bee eſtéemed as much as $\frac{1}{2}$ of the ſtocke which the marchant layeth in, that is to ſay, the $\frac{1}{2}$ of 1200 li. which is 600 li. The reaſon is, for because the $\frac{1}{3}$ of ỹ gaine

that

that the Factor taketh, is the $\frac{1}{2}$ of the $\frac{2}{3}$ of the gaine that the Marchant taketh. And so the Factor his person is estéemed to be worth 600 li.

11 A Marchant hath deliuered vnto his Factor 1200 li. and the Factor layeth in 500 li. and his person. Now because hee layeth in 500 li. and his person, it is agréed betwéen thē, that he shall take the $\frac{2}{3}$ of the gaine: I demaund, for how much his person was estéemed? Answer. Forasmuch as the Factor taketh the $\frac{2}{5}$ of the gaine, he taketh the $\frac{2}{3}$ of that which the marchant taketh, for $\frac{2}{5}$ are the $\frac{2}{3}$ of $\frac{3}{5}$: and therfore the Factors laying in, ought to be 800 li. which is the $\frac{2}{3}$ of 1200 li. that the Marchant layd in. Then abate 500 li. which the Factor did lay in from 800 li. which should bée his whole stocke & there remaineth 300 li. for the estimation of his person.

12 More, A Marchant hath deliuered vnto his Factor 1000 li. vpon such

ſuch condition, that the factor for his paines & ſeruice, ſhall haue the gains of 200 li, as though he laid in ſo much ready money: I demaund what portion of the gaine the ſaid Factor ſhal take? Anſwere. See what part the 200 li. (which the Factor laid in) is of 1200, which is the whole ſtocke of their company, & you ſhall find that it is the $\frac{1}{6}$, and ſuch part of the gaine ſhall the Factor take.

But in caſe, that in making their couenants, it were agréed betwéene them, that the Factor ſholud haue the gaine of 200 li of the whole ſtocke which the marchant layeth in, that is to ſay, of the 1000 li. Then ſhold the Factor take the $\frac{1}{7}$ of the gaine: for 200 li. is the $\frac{1}{5}$ of a 1000 li.

Chap. 11.

Of the Rules of Barter: that is to ſay, to change ware for ware, &c.

1 TWo Marchants will change their marchandize, ẏ one with the

the other. The one of them hath cloth of 7 s̄. 1 d̄. the yard, to sell for ready money, but in barter he will sell it for 8 s. 4 d̄. The other hath Sinamon of 4 s̄. 7 d̄. the li. to sell for ready mony, I demand how hée shall sell it in barter that he bée no loser? Answ. Say if $7\frac{1}{12}$ (which is the price that the yard of Cloth is worth in ready money) be sould in barter for $8\frac{1}{3}$, for what shall $4\frac{7}{12}$ bée sould in barter, which $4\frac{7}{12}$ is the price that the li. of Sinamon is worth in ready money? reduce the whole numbers into their broken, and then multiply and diuide and you shall find 5 s̄. 4 d̄. $\frac{12}{17}$ parts of a penny, and for so much shall hée sell the pound of Sinamon in barter.

2 Two Marchants will barter their marchandize ỹ one with the other: the one of them hath Chamblets, of 2 li. 18 s̄. 4 d̄. the péece, to sel for ready money, and in barter he will sel the péece for 4 li. 3 s̄. 4 d̄. ỹ other hath fine caps of 35 s̄. 10 d̄. the dozen, to sell in barter

ter. I demaund what the dozen of cappes were wozth in ready money: An. ſay if 4 li. 3 s̄. 4 d̄. which is the ouer pzice of the péece of Chamblet, be come of 2 li. 18 s̄. 4 d̄. which was the iuſt pzice of the ſame, of what ſhall come 35 s̄. 10 d̄. which is the ouer pzice of the dozen of caps: Multiply and diuide, and you ſhal find 25 s̄. 1 d̄. and ſo much are the dozen of cappes wozth in ready money.

3 Two Marchants will change their marchandize the one with the other: the one of them hath Fuſteās of 18 s. 4 d̄. the péece to ſel foz ready money, and in barter he will ſel the péce foz 26 s̄. 8 d̄. The other hath tapeſtry of 15 d̄. the elle to ſell foz ready mony and in barter he wil ſel it foz 20 d̄. the Elle. I demaund which of them gaineth, and how much vpon the 100 li. of money: Anſ. ſay if 18 s̄. $\frac{1}{3}$ (which is the iuſt pzice of ỹ péce of Fuſtean) be ſold in barter foz 26 s̄. $\frac{2}{3}$: foz how much ſhall 1 s̄. $\frac{1}{4}$, (which is the iuſt pzice of the elle of tapeſtry) be ſold in barter

barter: multiply and diuide, and you shall find 21 ď $\frac{9}{11}$. And he doth ouer sell it but for 20 ď. So that of 21. $\frac{7}{11}$. he maketh but 20 ď. And therfore say by the rule of three, if the second marchant, of 21 $\frac{9}{11}$ do make but $\frac{20}{1}$, how much shall he lose in the $\frac{100}{1}$. Multiply and diuide, & you shal find 91 $\frac{1}{3}$ the which beeing abated from 100, there will remaine 8 $\frac{1}{3}$. And after the rate of 8 $\frac{1}{3}$, doth ỹ second marchant lose in the 100. And consequently, the first marchant of 20 ď. maketh 21 ď. $\frac{9}{11}$, & therfore say again by the rule of three, if the first marchãt of $\frac{20}{1}$ doe make 21 $\frac{9}{11}$, how much shal he gaine vpon $\frac{100}{1}$, Multiply and diuide, and you shall find 109 li. $\frac{1}{11}$. And thus the first marchant gaineth after the rate of 9. li. $\frac{1}{11}$ vpon the 100 li. of money.

For your better vnderstanding of these questions, you must note, that when one marchant gaineth of another after the rate of 10 li. vpon the 100 li. he gaineth the $\frac{1}{10}$ of his owne principall, and the other which loseth *Note.*

after

after the rate of $9\frac{1}{11}$ in the 100 li. hée loseth the $\frac{1}{11}$ of his principall. And it may be proued thus: when one Marchãt will sel his wares vnto another, which wares stand him but in a 100 li. and hée will sell them for 110 li. therfore he of his 100 li. maketh 110 li. and so he gaineth after 10 li. vpon the 100, which is the $\frac{1}{10}$ of his principall, & the other which buyeth wares for 110 li. ỹ cost the other but 100 li. of the 110 li. he maketh but 100 li. & therfore say by the rule of 3. if 110 become of 100, how much shall come 100? Multiply & diuide, and you shall find $90\frac{10}{11}$. the which abate from 100 and there will remaine $9\frac{1}{11}$ which is the $\frac{1}{11}$ of the principall that the secõd loseth in ỹ 100 li. as before is sayd. And therefore, who so that wil know what one Marchant gaineth of another, either after the rate of 10 li. vpon the 100 li. which is the $\frac{1}{20}$ of his principall, or else after the rate of 20 li. vpon the 100 li. which is the $\frac{1}{5}$, or of any other part, and that hée would

like-

likewise know what part the other loseth of his principall, hée must take for the numerator of the broken number of him that loseth, as much as for him that gaineth, then adde the numerator and the denominator (of the broken number of him that gaineth) both together, and make thereof the denominator of the broken number of him that loseth, & thẽ shal you haue the iust part of him that loseth: as by example, of him that gaineth after 10 li. vpon the 100 li. which is the $\frac{1}{10}$ of his principall: take the numerator of $\frac{1}{10}$ which is 1, and make that the numerator of the broken number of him that loseth, then adde 1, which is the numerator of the fraction of him that gaineth with 10, which is his denominator, & you shall haue 11 for the denominator of the Fraction of him that loseth. Then put 1 ouer the 11 & so you shall haue $\frac{1}{11}$. Thus it appeareth when one Marchant gaineth of another after 10 li. vpon the 100 li. he gaineth the $\frac{1}{10}$ of his principall, and ye

other

other loseth 9 $\frac{1}{11}$, which is the $\frac{1}{11}$ of his principall. And if he would gaine after 20 vpon the 100 li. which is the $\frac{2}{5}$ of his principall, the other should lose 16 $\frac{2}{3}$, which is the $\frac{1}{6}$ of his principall, and so is to be vnderstood of all other Fractions.

4 Two Marchants will change their Marchandize, the one with the other, the one of them hath Sayes of 20 s̄. and 10 d̄. the péece to sell for ready money: and in barter he will sell the péece for 23 s. 4 d̄. and yet he will gaine moresouer, after 10 poūd vpon the 100 pound. The other hath woll of 50 s̄. the 100 waight to sel for ready money. I demaund how hée shall sell C of woll in barter? Answ. Say, if 20 s. 10 d̄. which is the iust price of the péece of Say, be sold in barter for 23 s. 4 d̄. for how much shall 50 s. (which is the iust price of the C. of wool) be sold in barter? Multiply and diuide, and you shall find 56 s. Then for because ỹ first marchant wil gain

after

after 10 l. vpon the 100 li. he maketh of his 100 li. 110 li. ſo the ſecond marchant maketh of 110 l. but 100 l. And therefore ſay by the rule of three, if the ſecond Marchant of 110 doe make but 100, how much ſhall he make of 56? Multiply and diuide, and you ſhall find 50 s. 10 d. $\frac{10}{11}$ of a peny, and for ſo much ſhall hee ſell the Pound-zed of Wooll in barter.

5 More, two marchants will change their marchandiſe the one with the other, the one of them hath Taffeta of 16 crownes the peece, to ſell for ready money, and in barter hee will ſell the peece for 20 crownes, and yet he will gaine moreouer after the rate of 10 li. vpon the 100 li. The other hath ginger of 3 s. 9 d. the pound waight, to ſell in barter. I demaund what the pound did coſt in ready money? Anſ. ſay if 20 crownes which is ỹ ſurpaſſe of the peece of Taffeta, become of 16 crownes the iuſt price, of how much ſhall come 3 s. 9 d. Which is ỹ ſurpaſſe

of the pound of Ginger: Multiply and diuide, and you shall find 3 shil. Then, for because that the marchant of Taffata will gain after the rate of 10 vpon the 100: Say if 100 doe giue 110: what shall 3 s̄. giue: multiply and diuide, and you shall find 3 s. 3 d. $\frac{3}{11}$ and so much did the Pound of Ginger cost in ready money.

6 More, two marchants will change their marchandize, the one with the other, the one of thē hath Worsteds of 25 s̄. the péece to sel for ready money, and in barter he will sell the péce for 33 s̄. 4 d. and yet he loseth after 10 li. in the 100 li. the other hath Ware of 3 li. 6 s̄. 8 d. the 100 waight to sell for ready money. I wold know for what price he should sell his Ware in barter: Anſ. Say if 25 s̄. which is the iuſt price of the péece of Worsted, bée sold in barter for 33 s̄. 4 d. for how much shall 3 pound 6 s̄. 8 d. bée sold: which is the iuſt price of the 100 of ware, as it was worth in ready money.

ney. Multiply and diuide & you ſhall find 4 li $\frac{4}{9}$ which is 8 s. 10 d. $\frac{2}{3}$, then for becauſe that ỹ marchant of Worſteds, loſeth after 10 li. in the 100 li. of 100 li. he maketh but 90, and therfore ſay, if 90 giue 100, what giueth 4 pound $\frac{4}{9}$: Multiply and diuide, and you ſhall find 4 li. $\frac{76}{81}$, which is worth 18 s. 9 d, $\frac{5}{27}$ and for ſo much ſhall hée ſell the 100 pound waight of Ware in Barter.

7 More, Two Marchants will change their Marchandize the one with the other: the one of them hath worſteds of 5 li. 6 s. 8 d. the péece to ſel for ready mony, and in Barter hée will ſell the péece for 6 li. 13 s. 4 d. & yet he loſeth after 10 li, in the 100. & the other hath Muſke of 2 s. 9 d. $\frac{1}{3}$ the pound waight to ſell in barter. I demaund what the Pound did coſt in ready money? Anſw. Say if 6 li. $\frac{2}{3}$, which is the ouerprice of the péece of Worſted, become of 5 li. $\frac{1}{3}$, which is the iuſt price of the ſame, of how much

shall come 2 s. 9 d. $\frac{1}{3}$. Multiply and diuide, & you shall find 2 s. $\frac{2}{9}$, which $\frac{2}{9}$ is 2 d. $\frac{2}{3}$: then for because that the marchant of Wolsteds loseth after 10 li. in the 100 li. of a 100 hee maketh but 90: and therefore say, if 100 giue but 90, how much shall 2 s. $\frac{2}{9}$ giue? Multiply and diuide, and you shall find 2 s. and so much cost the pound of Muske in ready money.

Other Rules of Barter, wherein is *giuen some part in ready money.*

When a Marchant ouerselleth his marchandize, and he will haue also some part of his ouer-price in ready money: as the $\frac{1}{2}$, the $\frac{1}{3}$, or the $\frac{1}{4}$, &c. Ye must subtract the same part of mony from the iust price, and also from the ouer price of his Marchandize: and the two numbers that remaine after the subtractiō is made shall be the two first numbers in the rule of three: and the iust price of the second Marchant shall bee the third

number

number: to know how much hée ſhall ouer ſell the part of his marchandize.

Example.

§ Two Marchants will change their marchandize the one with the ather, the one of them hath fine Woll at 50 li. the 100 li. waight to ſell for ready mony, and in barter he wil ſell it for 6 li. and yet he will haue the $\frac{1}{7}$, in ready mony. The other hath cloth of 13 s. 4 d. the yard to ſell for ready money. I would know how he ſhall ſell the ſame in barter? Anſ. take the $\frac{1}{7}$ of 6 li. which is the ouerprice of the 100 of woll, and that is 2 li. $\frac{6}{7}$ which you muſt abate from 5 li. which is the iuſt price of $\frac{6}{7}$ C. of woll, & alſo abate it fro 6 l. which is the ouerprice, and there ſhall reſt 3 li. and 4 li. for $\frac{6}{7}$ two firſt numbers in the rule of thrée; thē take 13 s. 4 d. which is the iuſt price of a yard of cloth, for the third number: Then multiply and diuide, & you ſhall find 17 s. 9 d. $\frac{1}{7}$ for ſo much ſhall

the second sell his cloth in barter.

9 More, two marchants will change their marchandize the one with the other, the one of thē hath ware of 3 li. 6 s. 8 d. the C. to sell for ready money, and in barter he will sell the same for 4 li. 3 s. 4 d. and yet he will haue the $\frac{1}{4}$ in ready money: And the other hath fine Crimson Satten of 15 s. ȳ yard, to sell in barter. I demand what it is worth in ready money? Answ. Take the $\frac{1}{4}$ of 4 li. 3 s. 4 d. which is 1 li. 0 s. 10 d. and abate it from 4 li. 3 s. 4 d. & also from 3 li. 6 s. 8 d. & there resteth 3 li. 2 s. 6 d. and 2 li. 5 s. 10 pence, for the two first numbers in the Rule of three. And 15 s. for the third number which 15 shil. is the ouer price of the yard of Satten. The Multiply and diuide and you shall find 11 shil. And so much did the yard of Satten cost in ready money.

10 Two Marchants will change their marchandize the one with the other

ther: the one of them hath Tinne of 50 s. the C. waight, to sell for ready money, and in barter he wil sell it for 3 li. 6 s. 8 d. and hee will gaine after 10 li. vpon the 100 li. & yet he wil haue also the one halfe in redy mony. The other hath leade of 3 halfe pence the li, to sell for ready money. I demand how he shall sell the 1 i. of lead in barter? Ans. Vse first at 10 li. vpon the 100 li, what the 3 li. $\frac{1}{3}$ will come vnto, in saying by the Rule of Three, if 100 giue 110, what will 3 $\frac{1}{3}$, giue? Multiply & diuide, and you shall find that they will come to 3 li. $\frac{2}{3}$, which is 13 s. 4 d. of ỹ which, ỹ halfe which he demaundeth in ready money, is 36 shil. 8 d. the same being abated from 50 s. and also from 3 l. 13 s. 4 d. there will remaine 13 s. 4 d. and 1 li. 16 s. 8 d. for the two first numbers in the Rule of three, which you must put all into halfepence, and the foresaid three halfepence shall be the third number, and then multiply & diuide, and you shall find 4 d. $\frac{1}{8}$, and for so much shall

hée ſell the 1 li. of leads in barter.

11 Note, Two Marchants will change their marchandiſe ỹ one with the other: the one of them hath ſtéele of 16 s. 8 d. the 100 li. waight, to ſel for ready mony, and in barter he wil ſell it for 25 s. and yet he loſeth after 10 li. in the 100 li. but hee will haue the $\frac{1}{3}$ in ready money: the other hath yron of 6 s. 8 d. the hundred to ſell in barter. I demaund what the hundred of yron did coſt in ready money? Anſ. ſay if 100 come but to 90, how much ſhall 25 s. come to? Multiply and diuide, and you ſhall find 22 s. 6 d. of the which number, take the $\frac{1}{3}$ which is 11 s. 3 d. and ſubſtract it from 22 s 6 d. and alſo from 16 s. 8 d. and there will remain 11 s. 3 d. and 5 s. 5 d. for the 2 firſt numbers in the rule of 3, & 6 s. 8 d. which is the ouer price of a hundred of yron for the third number: then multiply & diuide, and you ſhall find 3 s. 2 d. $\frac{14}{17}$: & ſo much did ỹ hundred of yron coſt in ready money.

12 Moze, two marchants wil change their marchandise the one with the o-ther: the one of them hath saies of 20 s̄. 10 d. the pece to sell foz ready mo-ney, & in barter he will sell the pece foz 25 s. and he will haue ȳ $\frac{1}{4}$ in ready money. The other hath caps of 35 s̄. the dozen, to sell foz ready money, but hée will gaine after the rate of 10 li. vpon the 100 li. I demaund how hée shall sell a dozen of caps in barter?

Answere. Say if 100 be wozth 110. What shall 35 s̄. be wozth, which is the iust price of ȳ dozen of caps: Mul-tiply and diuide, & you shall find 38. shil. 6 d. Then take ȳ $\frac{1}{4}$ of 25 s̄. which is 6 s̄. 3 d. and substract it from 20s̄ 10 d. and also from 25 s̄. & there will remain 14 s. 7 d. & 18 s. 9 d. foz the 2 first numbers in the rule of thzée, and 38 s. 6 d. which is the iust pzice with his gaine in the dozen of caps foz the third number: then multiply and di-uide, and you shall find 49 s. 6 d. and foz so much hee shall sell the dozen of caps in barter.

The

Chap. 12.

Of Exchanging of money from one place to another.

FIrſt you muſt note, that at Antwerpe they vſe to make their accounts by Deniers de gros, that is to ſay, by pence Flemiſh, whereof 12 do make 1 s. Flemiſh, and 20 ſhil. Flemmiſh do make 1 li. de gros.

Example.

1 If I deliuer in Flaunders 500 li. Flemmiſh at 19 s. 6 d. de gros, that is to ſay, at 19 s. 6 d. Flẽmiſh, to receiue 20 s. at London. I demand how much I ſhall receiue ſterling at London for the ſaid 500 li. Flemmiſh. Anſwer. Say if $19\frac{1}{2}$ giue $\frac{20}{1}$, what will $\frac{500}{1}$ giue? Multiply and diuide, and you ſhall find 512 li. 16 s. 4 d. $\frac{12}{13}$ of a penny. And ſo much ſterling ſhall I receiue in London for my 500 pound Flemmiſh.

2 If I deliuer in London 375 li, sterling, to receiue in Antwerp 21 s. 9 d. the gros, that is to say, Flemish, for euery pound sterling. I demaund how many pounds Flemmish I shall receiue in Antwerp for the sayd 375 li. sterling? Answ. Say if $\frac{20}{1}$ giue 21 $\frac{3}{4}$ what will $\frac{375}{1}$ giue? Multiply and diuide and you shall find 407 li. 16 s. 3 d. So many Pounds Flemmish shall I receiue in Antwerpe for the said 375 li. ster. in Antwerpe.

3 If I take vp money at Antwerpe, after 19 s. 6 d. Flemish, to pay for the same at London 20 s. ster. and when the day of paymẽt is come, I am forced to returne the same, & to take vp money againe in London to pay my bil of exchange, so that for 20 s. which I take vp heere, I must pay 19 s. 9 d. at Antwerpe. I demaund whether I doe winne or lose, and how much in, or vpon the 100 li. of money? Ans. Say, if 19 $\frac{3}{4}$, giue 19 $\frac{1}{2}$, what will $\frac{100}{1}$ giue? multiply and diuide, & you shall find

find 98 $\frac{58}{75}$, the which beeing abated from 100, there will remaine 1, $\frac{21}{75}$. And so much do I lose vpon the 100 pound of money.

4 If I take vp at London 20 ℔, starling to pay at Antwarp 21 ℔.8 d. Flemish; and when the day of payment is come, my Factor is constrained to take vp money againe at Antwarp, wherwith to pay the forsaid summe: and there he doth receive 22 shil. Flemish, for the which I must pay 20 ℔. at London. Now I demand whether I do win or lose, and how much vpon the 10 li. of money after the rate? Anſ. Say if 21 $\frac{1}{2}$ give $\frac{22}{1}$. What will $\frac{100}{1}$, give? Multiply and divide, and you shall find 101 $\frac{7}{11}$, from the which abate 100, and there will remaine 1 $\frac{7}{11}$, and so much shall I gaine vppon the 100 pound of money.

The Exchange from London into France, is not like as it is in Flanders, but is delivered by the French

Crowne

Crowne, which is worth 50 Souſe Tournois the péece.

And héere muſt you note, that in France they make their account by Deniers Tournois, whereof 12 Deniers maketh 1 ſouſe Tournois, and 20 ſouſe tournois maketh 1 li. Tournois, which they cal a Liure or franc, and the French Crowne is currant among marchants for 51 ſouſe tournois, but by exchange it is otherwiſe, for they will deliuer but 50 Souſe Tournois, which is 2 li. 10 ſouſe Turnois for a Crowne, and at ſuch price the Crowne, as the taker vp of money can agrée with the diliuerer. *Note.*

Example.

5 If I deliuer 340 li. ſter. héere in London, after 6 s. 4 d. ſterling the Crowne, to receiue at Roan, or at Paris 50 ſouſe Tournois for euery Crowne, I would know how many Liures Tournois, I ſhall receiue there for my 340 li. ſter: Anſw. Say

if

if 6 s. $\frac{1}{3}$ ſter. doe giue me 2 li. $\frac{1}{2}$, Tournois, what will $\frac{6\,8\,0\,0}{1}$ s. giue, (which is the 340 li. reduced into ſhillings.) Then multiply and diuide, & you ſhal find 2684 Liures, $\frac{4}{9}$ which is woꝛth 4 ſouſe $\frac{4}{9}$ Tournois, and ſo much ſhal I receiue in Roan oꝛ Paris foꝛ my 340 li. ſterling.

6 If I deliuer in Paris oꝛ Roan, oꝛ elſewhere in France 1250 Liures Tournois, at 50 ſouſe Tournois the Crowne, to receiue foꝛ euery ſuch Crowne 6 s 3 d. ſterling in London. I demaund how much ſterling money I ſhal receiue at London foꝛ my 1250 pound Tournois? Anſ. Say, if 2 li. $\frac{1}{2}$, doe giue me 6 ſhil. $\frac{1}{4}$, what will $\frac{1\,2\,5\,0}{1}$ giue? Multiply and diuide, and you ſhall find 2125 s. ſterling, which maketh 156 li. 5 s. ſterling. And ſo many pounds ſhall I receiue at London foꝛ the laye 1250 Liures Tournois, after 6 s. 3 d. foꝛ euery Crowne of 50 ſoulze.

The

Chap. 13.

Of the Rule of Alligation, or Mixture.

THe Rule of Alligation is so named for that it teacheth to alligate or bind together diuers parcels of sundry prices, and to know how much you shall take of every parcell, according to the numbers of the question, the which Rule is distinct into two parts: as followeth.

The first part of the rule of alligation sheweth how to make a mixture of diuers things being of sundry prices: And of the same things so mixed, to know the common price of the said mixture.

Example.

1 A man would mixe 5 bushels of Wheat at 2 s. 8 d. the bushel, with 9 bushels of Rie, at 2 s. the bushell, and would know how much the bushell

so

ſo mixed doth ſtand him in, the one with the other? Anſ. for to know the ſame common price. You muſt multiply euery thing by his price, and adde all the products together: the which you muſt diuide by the number of all the things that are to be mixed, and the quotient will anſwere to the queſtion, as in the foreſaid example, I multiply 5 buſhels by his price, that is to ſay, by 2 s. 8 d. and thereof commeth 13 s. 4 d. Likewiſe I multiply 9 buſhels by 2 s. maketh 18 s. both theſe ſums added together, doe make 31 s. 4 d. the which I do reduce into pence: & they make 376 pence. Then I diuide 376 by 14 which is ỹ number of all the buſhels, and my quotiẽt will be 26 pence and $\frac{6}{7}$, and ſo much doth one Buſhell of both the ſorts of graine ſtand him in.

2 If you haue two ſeuerall thinges, whereof you would mixe equall portions together, you muſt adde their prices & take only the $\frac{1}{2}$, if you would

mixe

mixe together equall portions of 3 things, you must take $\frac{1}{3}$, and of 4 the $\frac{1}{4}$ and so continuing, as by Example: Wheat of 2 s. 8 d. the bushell, and Rie of 2 s. the bushell being mingled by equall proportions, I adde 2 s. 8 d. and 2 s. together, & they make 4 s. 8 d. whereof the one $\frac{1}{2}$ is 2 s. 4 d. and so much is the value of one Bushell of such a mixture. And if there were a portion of barley at 20 d. then I must adde 2 s. 8 d. 2 s. & 20 d. together, and they make 6 s. 4 d. whereof ỹ $\frac{1}{3}$ which is 2 s. 1 d. $\frac{1}{3}$ should be the price of one bushell of that mixture.

3 A Marchant hath 27 li. waight of large Cloues at 6 s. the li. 15 l. of the middle sort at 2 s. 6 d. the li. And 10 li. of fuste at 2 s. 2 d. the li. when all ỹ same are mixed together, I would know how much the li. is worth? Answere. You must multiply euery drwg by his price, and then diuide the totall summe of the products, by the whole waight of the drwgs, and you

shall find 51 ℔. $\frac{1}{26}$, and so much is the ℔. of that mixture worth.

27	at	6 s. 0 ℔.	162
15	at	2 s. 0 ℔.	37 $\frac{1}{2}$.
10	at	2 s. 2 ℔.	21 $\frac{2}{3}$.
52			221 $\frac{1}{6}$.

4 And if you would mixe $\frac{1}{2}$ large cloues. $\frac{1}{3}$ of middle, and $\frac{1}{4}$ of fusk, and you would know how much the poũd waight were worth, you must take a nũber, which containeth those parts, as for example 12. whereof the $\frac{1}{2}$, which is 6 shal signifie so many pound of large cloues: The $\frac{1}{3}$ which is 4, shall be so many ℔. of middle, & the $\frac{1}{4}$, which is 3. shal be so many ℔. of fusk. Then afterwards you must multiply euery drwg by his price, & diuide the totall sum of all the products, by the whole sum of the drwgs, and you shal find 4 s. $\frac{1}{26}$. And so much is 1 pound waight of the mixture.

6. at 6 s. 0 d.	36
4. at 2 s. 6 d.	10
3. at 2 s. 2 d.	06 $\frac{1}{2}$
13	52 $\frac{1}{2}$

5 And if you would make 100 li. waight of such a mixture, you shall worke by the rule of company & you shall find 46 li. $\frac{2}{13}$ of large cloues, 30 li. $\frac{10}{13}$ of middle. And 23 $\frac{1}{13}$ of fault.

6			6. *Ans.* 46 $\frac{2}{13}$
4	13.	100	4. *Ans.* 30 $\frac{10}{13}$
3			3. *Ans.* 23 $\frac{1}{13}$
13			100

6 A Goldsmith hath 8 li. waight of siluer billion of 7 oũces fine, more 15 li. of 8 oũces $\frac{1}{2}$ fine, & 13 li. waight of 10 ounces fine, and he will melt all these together, and make of them one masse. The question is to know of what finesse the Pound waight is? Answere. you must multiply the number of the waights of euery Billion by his finesse, and therof wil come the

ounces and parts of ounces fine, the which you must adde together, & they will make 313 ounces $\frac{1}{2}$ of fine, the same you must diuide by 36 which is the whole Sum of the pound waight of Billion, and you shall find 8 ounc. and $\frac{52}{72}$ remaining, which $\frac{52}{72}$ parts of an ounce is worth 14 peny waight & 4 graines, and so much is the pound waight of this mixture worth.

8	*Lib. at*	7 *onz. is*	56
15	*at*	8 *onz.* $\frac{1}{2}$ *is*	127 $\frac{1}{2}$
13	*at*	10 *onz. is*	130
36.			313 $\frac{1}{2}$

7 A Goldesmith hath 3 sorts of Siluer byllion, that is to say 5 li, 7 oũces 10 peny waight, at 7 ounces $\frac{1}{2}$ fine: 12 li. 3 oũces, at 6 ounces $\frac{1}{3}$ fine. And 4 li. at 9 oũces fine. All ỹ which he will melt into one masse. The question is to know, of what finesse the pound waight of that mixture shal be: Anſ. You must multiply euery Byllion by his finesse, as afore. And adde

together

together all the products, and they do amount to 155 li. $\frac{37}{48}$. Then adde all the waights of the Millions together into one ſumme, and they make 21 li. $\frac{7}{8}$, diuide then 155 $\frac{37}{48}$, by 21 $\frac{7}{8}$, and your quotient will be 7 ounces and $\frac{101}{840}$ remaining, the which $\frac{1}{8}$ $\frac{16}{100}$, being brought into penny waights and graines, do make 2 peny waight, 10 graines $\frac{2}{35}$, of a graine fine. So you may perceiue that the ſame mixture is of 7 ounc. 2 d. 10 graines, and $\frac{2}{35}$ of a graine fine, the pound waight.

And hére is to bée noted, that the reckoning of the waights of Siluer is thus as followeth, that is to ſay,

1 li. of Troy waight, maketh 12 Dunces.

1 Dunce is diuided in 20 pennies waight.

1 Peny waight is diſtributed into 24 graines.

1 Graine into 20 ſmaller parts, &c.

And the reckouing for Gold, is thus,

1 Ounce of fine Gold without any alloy, is imagined to be 24 karets.
1 Karet is diuided into 4 grains.
1 Grain is parted into 2 halfe grains or 4 quarters of a graine, &c.
And so into other smaller parts.

8 But if the sayd Goldsmith would put 5 li. waight of Copper with the said Billions, and you would know of what finesse it is, then you must ad the same 5 li. with the 21 li. $\frac{7}{8}$, and it maketh 26 $\frac{7}{8}$. Then diuide the aforesaid 155 li. $\frac{37}{48}$, by 26 li. $\frac{7}{8}$, and you shall find 5 ounces fine, and $\frac{8}{15}\frac{2}{3}\frac{7}{2}\frac{6}{5}$ remayning, the which $\frac{8}{15}\frac{2}{3}\frac{1}{2}\frac{6}{0}$ is worth 15 peny waight, 22 graines and $\frac{6}{45}$. And of that finesse wil the same masse bée

9 A Goldsmith hath melted 12 li. waight, and 5 ounces of Gold Billion, being of 18 Karets fine. with 4 li. waight, 4 ounces and $\frac{1}{2}$, at 21 Karets fine, I demaund of what finesse is 1 li. waight of the same masse: Ans.

you

you must multiply the waights (by the karats fine) of each sort, & add the products together, the same you must diuide by the whole summe of all the waights added together, and your quotient wil shew you of what finesse the same is of, as in the former example, I do multiply 12 li. & 5 ounces by 18 karets, and therof commeth 223 karetts $\frac{1}{2}$. Likewise I doe multiply 4 li. waight, 4 ounces $\frac{1}{2}$, by 21 karets, and thereof commeth 91 Karetts $\frac{7}{8}$, these two summes of Karetts I doe adde together & they make 315 Karetts $\frac{3}{8}$. Then I do adde 12 li. waight 5 ounc. and 4 li. waight 4 ounces and $\frac{1}{2}$ together, & they make 16 li. 9 ounc. $\frac{1}{2}$, the which 9 ounces $\frac{1}{2}$ are $\frac{19}{24}$ parts of a pound: & therefore I diuide 315 $\frac{3}{8}$ by 16 li. $\frac{19}{24}$, and thereof commeth 18 karets, & $\frac{25}{3}\frac{20}{224}$ remaining, which fraction is 3 graines, and $\frac{51}{403}$ parts of a graine. And of that finesse is 1 li. waight of the said masse.

A Goldsmith hath melted 10 poũd waight, 7 ounces, and $\frac{1}{2}$ of 20 karets,

and $\frac{1}{3}$ fine. And 8 li. waight, 2 ounces and $\frac{1}{6}$ parts of 23 karets fine, with 15 li. waight, 1 oũce of Siluer. The question is, of what finenes is ỹ poũd waight of the said masse? Ans. You must multiply the waight of euery sort of Gold billion by his allay, that is to say, by his finenesse, and adde all the products together, and you shall find 340 karetts $\frac{25}{72}$, then adde the waight of the two sorts of Gold billion, with the waight of the Siluer together, and thereof will come 33 li. 11 ounces, $\frac{1}{24}$, the which 11 ounces $\frac{1}{24}$ is $\frac{16}{288}$ of a pound waight, then diuide the sayd 340 karretts $\frac{25}{72}$ parts by 33 pounds $\frac{296}{288}$. And you shall find 10 Karetts $\frac{420}{1037}\frac{5}{1}$. And of the same finesse shall the pound waight of that masse of Gold be.

The second part of the rule of Alligation.

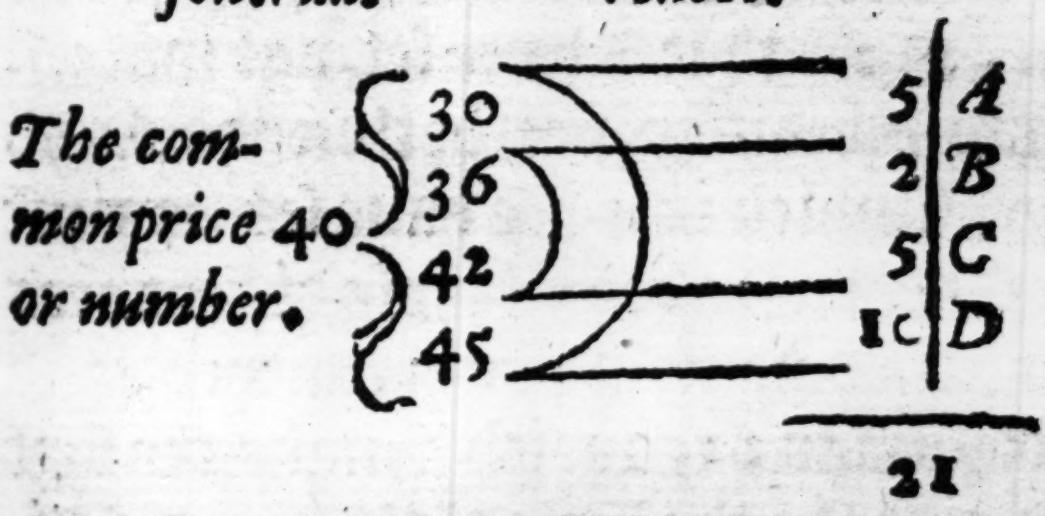
1 A Goldsmith hath 4 sorts of gold, The first is worth 30 Crownes the pound waight, the secõd is worth 36 Crownes,

Crownes, and the third is worth 42 Crownes, and the fourth is worth 45 Crownes, and of these 4 sorts he wil make a Scepter of 6 pound waight, which shal be worth 40 Crownes the Pound. I demaund how much hée must take of euery sort. Answ. First you must set down the nũbers whereof you wil make the alligation (which are 30, 36, 42, and 45) orderly the one vnder the other, after the same maner as if you would adde them together: and the common number whereunto you will reduce them, you shall set on the left hand, which common number in this example is 40. Then marke which of the said foure numbers, are lesser then that common number, and which of them be greater, and with a draught of your pen, euermore linke two numbers together, so that the one be lesser then that common number, & the other greater thẽ it, for two greater, nor two smaller numbers may not be linked together, for they will either be lesser, or els greater thẽ the com-

commõ number but one greater nũber, and one ſmaller may be ſo mixed that they will make the common nũber. And two greater or two ſmaller nũbers, can neuer make the common number in due order, as hereafter ſhall appeare.

After ỹ you haue thus linked them, then marke how much each of the leſſer numbers is ſmaller then the common number, and that difference you ſhall ſet againſt the greater numbers which bee linked with thoſe ſmaller, each of them with his match ſtill on the right hãd. And likewiſe you muſt ſet the exceſſe of the greater numbers againſt the leſſer, which bee combined with them. Then ſhall you adde all thoſe differences into one Summe, which ſhall be the firſt number in the Rule of three, and the ſecond number ſhalbe the whole maſſy peece that you will haue of al the particulars, which in this example was preſuppoſed to be 6 li. Then the third ſumme ſhalbe each difference by it ſelfe, and by thẽ

ſhall you find out the fourth number declaring the iuſt portion that you ſhall take of euery particular in that mixture, as now by the former example, I will make it more plaine.



21. 6. 5. || 21. 6. 2.

21, 6. 4. || 21. 6. 10.

Heere in this former exampple, you ſée that I haue ſet downe the ſeuerall prices, which be 30, 26, 42, 45, and haue linked together 30, with 45, & 36, with 42. The common price 40. I haue ſet on the left ſide, as before is declared, and the difference of it frō euery

euery seuerall price, I haue set on the right hand, against that summe with the which it is linked. So the difference of 30, from 40, is 10, which I set against 45, ỹ he is linked withall; and the difference of 45, aboue 40 is 5, which I haue set against 30. So likewise, the difference of 42, aboue 40, is 2, that I haue set against 36. And the difference betwéene 36 and 40, (which is 4) I haue set against 42. Then I adde all those differences together, namely 5, 2, 4, and 10, and they make 21, which I make the first number in the Rule of thrée, and 6 li. which is the waight of the Scepter of Gold the second number, and the third number shalbe euery particular difference for euery seueral working Then worke by the rule of thrée: saying if 21 (which is all the differences added together) doe giue me 6 pound waight, which is the waight of the Scepter, what shall 5 giue, which is the first difference?

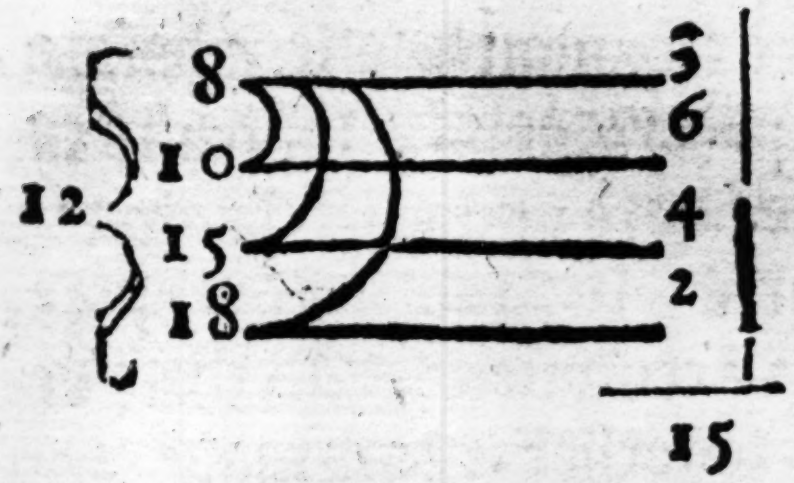
I multiply and diuide, and I find 1

li.

l̃i. waight $\frac{3}{7}$, ſo much muſt I haue of ỹ firſt prize. Then I do in like maner w̃ the reſt, & I find $\frac{4}{7}$ of a li. waight of the ſecond prize, 1 l̃. $\frac{1}{7}$ of ỹ third prize: and 2 li. $\frac{6}{7}$ of the fourth, the which 4 ſummes beeing added together, doe make 6 li which is the whole waight of the Scepter that I wold haue. And now to prowe if the péces doe agrée, you ſhall do thus: Firſt multiply this totall ſumme 6 by the common prize 40, and it will make 240 Crownes, which you ſhall kéepe by it ſelfe. And afterward multiply euery ſeuerall ſumme of waight by the prize belonging to the ſame waight, and if that ſumme doe agrée with the firſt ỹ you kept by it ſelfe, thẽ is your work well done, as héere 1 l̃i. $\frac{3}{7}$, is the waight of ỹ ſort of Gold which is of 30 crowns prize. Therefore multiply 30 by 1 l̃i. $\frac{3}{7}$, and it maketh 42 crowns $\frac{6}{7}$, which you muſt ſet down. Then multiply $\frac{4}{7}$ (which is the waight of the ſecond ſort of Gould) by 36 which is the prize of the ſame, and therof commeth

20 crowns $\frac{4}{7}$: ſo againe 1 li. $\frac{3}{7}$, multiplyed by 42 Crownes, which is the third price, doth make 48 Crownes. And laſt of al 2 li. $\frac{6}{7}$, multiplied by 45. maketh 128 crownes $\frac{4}{7}$. All theſe being added together, doth make 240 crownes agreeable to the former ſum of 40, multiplyed by 6. And thus I may affirme that this worke is well done.

2 A Tauerner hath foure ſorts of wine, of foure ſeuerall prices, the firſt of 8 pence the Gallond, the ſecond of 10 pence the gallond, the third of 15 pence, & the fourth of 18 pence. And hée will mixe all theſe ſorts together, ſo that the gallond ſhall be worth but 12 pence. I demaund how many Gallonds he muſt take of euery ſort? Anſwer. Firſt ſuppoſe the punchen to hold ſome certaine meaſure, as to containe 84 Gallonds, and then the ſame will be after this ſort, as you ſée hereafter followeth.



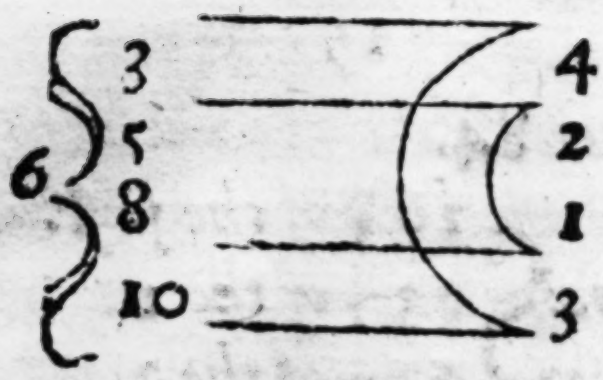
If 15 *doe giue* 84.

What will 3 } *giue?* } 16 $\frac{4}{5}$ *of the firſt.*
What will 6 } *giue?* } 33 $\frac{3}{5}$ *of the* 2.
What will 4 } *They* } 22 $\frac{2}{5}$ *of the* 3.
What will 2 } *make* } 11 $\frac{1}{5}$ *of the* 4.
84

3 A Mint maſter hath 4 ſoꝛts of ſil-uer Billion of theſe fineſſe following The firſt is of 3 ounces fine; the ſecõd of 5 ounces fine, the third of 8 ounces fine, and the fourth of 10 ounces fine. And of all theſe 4 ſoꝛts, hee would make another ſoꝛt, that ſhould be but of 6 ounc. fine. The queſtion is to knoꝛw what poꝛtion he muſt take of e-uery of ẏ ſaid billions? Anſ. ſet doꝛwn the particuler fineſſe, the one vnder ẏ other, namely 3, 5, 8, and 10, and ſet 6

which

which is the common ſineſſe, before them toward your left hand, as héere you may ſée.



Then put the difference of 3 from 6 right againſt 10, and the difference of 6 from 10, which is 4, right againſt 3 Likewiſe ỹ differẽce of 5 frõ 6 which is 1, right againſt 8, & the difference of 6 from 8, which is 2, right againſt 5. This done, you ſhall conclude, that for euery 4 pound waight that hee taketh of the billion of 3 ounces fine, he muſt take 2 li. of the billion of 5 ounces fine, and 1 li. waight of the billiõ of 8 ounces fine, & 3 li. waight of the which is of 10 ounces fine. Or els if you pleaſe adde 4, 2, 1, and 3 together and they make 10 which ſhall bee the denominator of euery of the portiõs

that

that is to say, you shall take $\frac{4}{10}$ of the Billion of 3 oũces fine $\frac{2}{10}$ of ỹ which is of 5 ounces fine $\frac{1}{10}$ of ỹ of 8 ounces fine, and $\frac{3}{10}$ of that which is of 10 oũces fine. And so of all such like. And if you wold make 60 li. waight of such a mixture, you must adde 4, 2, 1, & 3, together, which maketh 10, and then worke by the rule of company saying, if 10 li. giue 60 li. what will 4 giue? and so likewise, what will 2 giue, &c. This forme may bee varied, by combining the particular values after this manner as heere you do see, and as in the other example, it is plaine.



4 Sometimes the value doth change his difference, and is linked vnto diuers, for to represent the portion that is to be take of euery thing, as by ex-

ample. A marchãt hath wheat of 2 s. 8 d. the bushell. Rie of 2 s. & barley of 16 d. the bushell, and he will make a mixture of these sorts which shall stãd him but in 22 pence the bushell. It is demaunded how much hée may take of euery sort of the said graine. Anſ. Put the difference of 22 from 32, & 24, right against the 16. And likewise the difference of 16 frõ 22 right against 32 and against 24: And you shall find for 6 bushels that he taketh of wheat, hée must take 6 bushels of Rie, & 12 bushels of Barley.

d.

22 { 32 ——— 6
   { 24 ——— 6
   { 16 ——— 10, & 2, 'or' 12.

5. A Mint master hath billion of 9 ounces 10 penny waight fine, and of the same he wold make money, which should be but of 6 ounc. fine, and therfore it behoueth him to melt copper there-

therewith, which is valued at 0 peny waight of fine. The question is to know how much siluer and copper he must mixe together: After that you haue put downe 9 ounc. ½ for the value of the siluer; and right vnder the same 0 for the copper, you must take the difference of 6 from 9 ½ which is 3 ½, and place the same summe right against the 0, for to signifie the portiõ of copper that he must take: And the deffe-rence of 0 frõ 6, is 6: the same you must set right against 9 ½, which shall represent the portion of siluer that he must take. And thus you sée, that for 6 li. of siluer ỹ hée taketh he must take 3 li. ½ of copper to make the said money of 6 ounces fine.

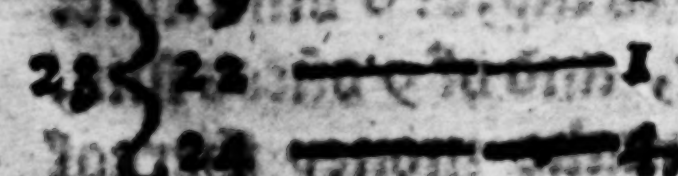
6	9 ½	6	li. ounc.
	0	3	li. ½ ct.

And if hée had 3. sorts of Siluer Billion, that is to say, of 6 ounc. fine of 7 ounces fine, and of 9 oũces fine, and hée would make money thereof

which should be but of 5 ounces fine, it behoueth him to mixe copper therwith. And this forme following doth shew how the same must bée combined, and likewise how much he must take of euery sort.



6 Likewise, a Mint master hath Billion of Gold, at 19 karets fine, some at 22 karets fine, some at 24 karets which is full fine without corruption, and hee will make coyne thereof, which shalbe 23 karets fine, it is demanded how much hée must take of euery sort: Answere. make your Alligation as this forme héereunder sheweth.



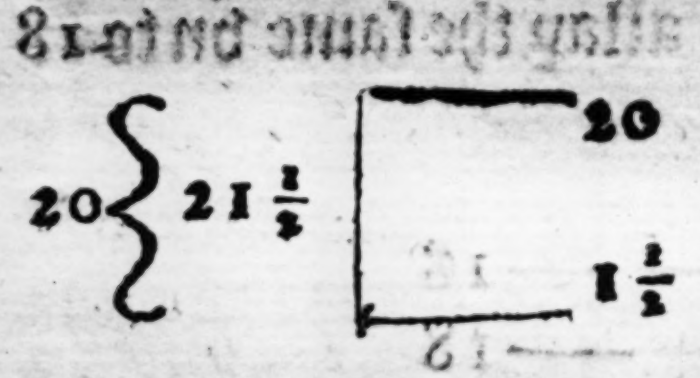
Woze

Moꝛe, the laid maſter hath Gold of 20 karets ½ fine, and of 22 karets fine, and he will allay the ſame to 18 karets fine. And foꝛ to doe the ſame, it is conuenient foꝛ him to mixe ſiluer therwith, which is eſtéemed at 0 karets fine, but pꝛoceéding accoꝛding to this Rule, hée ſhall find that foꝛ 18 pound waight, oꝛ other poꝛtions that he taketh of the 2 ſoꝛts of Billion of Gold, he muſt take 6 li. waight, and ½ of Siluer to allay the ſame vnto 18 karets fine.

18 { 20 ½ —— 18
22 —— 18
0 —— 2 ½ 4, that is 6 ½

7 Againe the ſaid Maſter hath 100 Pound waight of Gold at 22 karets fine, and 20 pound waight at 19 karets fine, the which he will allay to 20 karets fine. The queſtion is whether he ought to mixe any ſiluer with the ſame, yea oꝛ no, and how much?

Answ. You must consider (by ỹ first part of the rule of Alligation) the allay of the 100 li. and of the 20 li. being melted together, and you shal find that the same is of 21 ½ karets fine, & therefore forasmuch as the same is yet of a better finesse then hée would haue it, he must therefore mixe siluer therwith, that is to say, for 20 pound waight, of portions of Gold he must take thereto 1 li. ½ of Siluer.



8 If hée had 1 li. waight fine siluer of 12 Ounces fine, I demaund how much Copper hée must mixe with the same, to allay it vnto 11 ounc. ¾ fine, that is to say, to 11 ounces 3 pennie waight fine, make your Alligatiõ as before is taught. Then diuide the portion of copper, by the portion of fine, and you shall find $\frac{3}{4}$, which béeing abreuied, is $\frac{1}{15}$. And thus to euery li.

waight

waight of ſiluer, you muſt take $\frac{1}{11}$ of a li. of copper, and for euery 11 poũd $\frac{1}{4}$ of ſiluer, you muſt take $\frac{1}{4}$ of a li. of copper. And ſo is to be done with the ſame, in caſe that it were of any other allay.

9 A Maſter hath 1 li. of fine Gold of 24 karets fine, the which he would allay to 22 karets fine. The queſtion is, to know how much ſiluer muſt bée mixed with the ſame, that it may be of the fineſſe of 22 karets as before? Anſ. take the difference of 22 to 24, which is 2, thẽ diuide 2 by 22, which you cannot, for they are $\frac{2}{22}$, but abbreuie them, and it is $\frac{1}{11}$. And ſo much ſiluer muſt be mixed with 1 l. waight of fine Gold that the ſame may be of 22 karets fine.

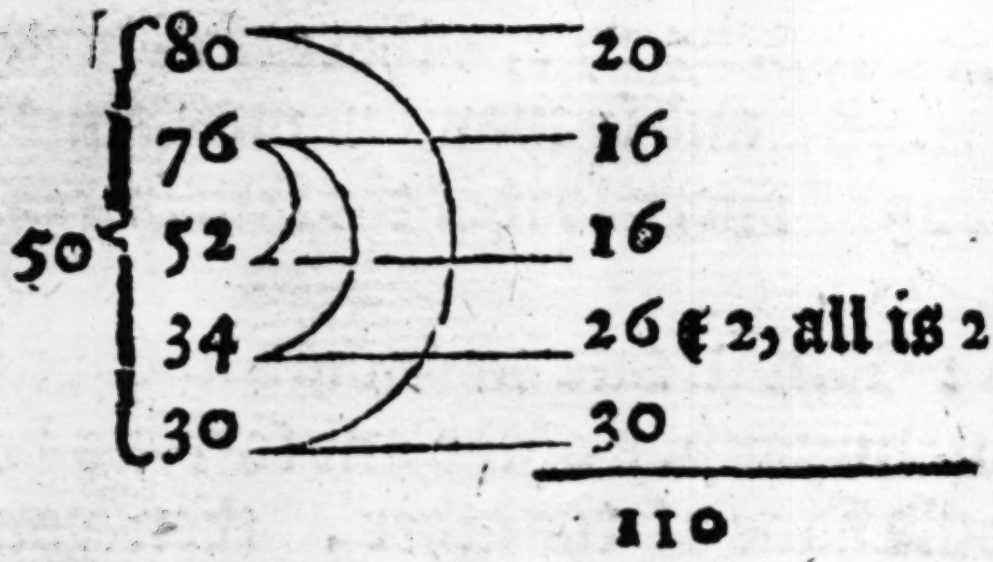
10 A Goldſmith hath 1 li. waight of Siluer billion of 7 oũces fine, it is demaunded how much fine ſiluer hée muſt put to the ſame, that being molten together, it may be of 10 ounces

fine. Answ. make your alligation of 7, and 12 vnto 10, and thē diuide the portion of the fine siluer, by the portion of siluer billon, and you shall find $1\frac{1}{2}$: and thus to 1 li. waight of 7 ounces fine, you must take 1 li. $\frac{1}{2}$ of fine siluer of 12 ounces fine to make the same of 10 ounces fine.

11 A Marchant hath giuen order vnto his Factor to employ him 83 li. 6 s. 8 d. ster. in 5 sorts of spices, that is to say, in Nutmegs at 80 d. ℔ pound Cloues at 76 d. the pound, Cinamon at 52 d. the pound, Ginger at 34 d, ℔ pound, and Peper at 30 d. the pound. But hee hath not appointed him the quantity or portion which hee should buy of euery sort, neither yet of al the sorts together: the questiō is to know how much the factor must buy of euery sort to haue of each of the like quātity. Answ. you must ad 80, 76, 52, 34, and 30, together, and they make 272. Thē must you diuide 83 li. 6 s. 8 d. being reduced into pence, name-

ly 20000 li. by 272, & thereof cõmeth 73 li. $\frac{0}{17}$, and so many pounds must he buy of euery sort of the said spices.

12 But in case hée would not haue so many pounds of the one sort, as he would haue of the other, then you must take another middle value betwéene the said particulars, as for example, let the meane number be 50 li. Then reduce ỹ said 83 li. 6 s. 8 d. into pence as the other prices are, & they do make 20000 pence, the same you must diuide by 50 pence, which is the meane or common price, & therof will come 400 li. And so many Pounds must he haue of all the sorts together. Then if you will know how many Pounds hé must haue of euery sort, you must set downe your particular prices, after the middle value, that is to say, after 50 li. as héerafter followeth: And then worke by the rule of company, and you shall find how much he shall buy of euery sort.



110 giue 400, what

20: *Anſ.* 72 $\frac{8}{11}$
16: *Anſ.* 58 $\frac{2}{11}$
16: *Anſ.* 58 $\frac{2}{11}$
28: *Anſ.* 101 $\frac{9}{11}$
30: *Anſ.* 109 $\frac{4}{11}$

400

Chap. 14.

Of the Rule of Falſhood, or falſe *Poſitions.*

THe Rule of falſhood is ſo named not for that it teacheth any deceit or falſhood, but that by fayned numbers taken at all aduentures, it teacheth to find out the true nũber that is demaunded. And this (of all ẏ vulgar rules which are in practiſe) is the

most excellent: This Rule hath two parts, the one is of one false position alone, the other is of two positions, as héereafter shall appeare.

Those questions which are done by false positions, haue their operations, in a maner like vnto that of the Rule of thrée: but only that in ỹ rule of thrée, we haue thrée nũbers knowen, and héere in this Rule, wé haue but 1 number that commeth in vse to work by: vnto ỹ likenes wherof, we must deuise two other numbers, the one multiplying, and the other diuiding, as by example.

1 I haue deliuered to a banket, a certaine summe of pounds in money, to haue of him by the yéere simply, 6 li. vpon the 100 li. And at the end of 10 yéeres, he payd me 500 li. for all, both principall and gaine. I demand how much was the principall summe that I deliuered him at the first: Here you sée that there are diuers termes: but the cheife to work withall is 500 li.

li. which commeth of the other numbers, that is to say, of 10, & 100, for of them is composed or made the tenor of the question, the practise whereof is thus.

Let vs faine a number at pleasure, and with the same let vs make our discourse, euen as though it were the principall summe that wée séeke for. As by example. Suppose that I deliuered him at ỹ first 200 li. the which were worth to mee in 10 yeares 120 li. after the rate of 6 li. vpon the 100 li. Then 120 li. added with 200 li. do make but 320 li. and I must haue 500 li. Thus you sée that I haue thrée termes of the rule of Thrée: the one which shall containe the Question, the other two which I haue formed artificially, which are 200 and 320: in such sort, that 320 ought to haue such proportion to 200, as 530 hath vnto the number that I séeke: that is to say, vnto the true principall sum, then must I haue recourse vnto the Rule of thrée, after this sort, saying.

If

If 320 li ? become of 200 li. of how much ſhall come 500 li. I doe multiply 500 by 200, and they are 10000, the which I muſt diuide by 320 li. & thereof commeth 312 li. $\frac{1}{2}$, which is the ſum that I deliuered at the firſt. And thus this rule hath ſome cõgruence with the double rule of thrée.

2 I haue a Ceſterne with 3 vnequal cocks, containing 60 pipes of water: And if the greateſt cocke be opened, ỹ water wil void cleane in one howre, at ỹ ſecond it will auoid in 2 howers, and at the third it will require thrée howers: now I demaund in what ſpace it will auoid, all the cockes being ſet open? Anſw. Suppoſe that it will auoide in halfe an howre: that is to ſay, in 30 minutes. Then muſt there auoide at the firſt cocke the $\frac{1}{2}$ which is 30 pipes: and by the ſecond cocke the $\frac{1}{4}$, which is 15 pipes, & by the third cocke the $\frac{1}{6}$, that is 10 pipes: all the which ſummes being added together, do make 55 pipes: but it

ſhould

ſhould be 60 pipes. Therefore ſay by the Rule of three, if 55 pipes do voyd in 30 minuts: in how many minutes will 60 pipes voide: Multiply and diuide, & you ſhall find 32 minuts $\frac{40}{55}$ the which $\frac{40}{55}$ being abbreuied are $\frac{8}{11}$ of a minut, & in that ſpace will ỹ water voyd, if all the cockes be ſet open.

Of the Rule of two falſe Poſitions.

THe ſumme of this Rule of Two falſe poſitions is thus, when any queſtion is propoſed appertaining to this Rule. Firſt you muſt imagine any number at your pleaſure, which you ſhall name the firſt poſition, and with the ſame you ſhal worke in ſtead of the true number, as the queſtion doth import: and if you ſée that you haue miſſed of the true number that you doe ſéeke; Then is the laſt number of ỹ worke, eyther too great, or too little, the which number, you ſhall note with the ſigne of more or leſſe,

for that is the first error, in the which you haue fayled, the which signes of more, & lesse, shall be noted with these figures ×, ——, This figure ×, betokeneth more: and this plaine line ——, signifieth lesse: that is to say, ỹ one signifieth too much, and the other too little: then you must begin again, & take another nũber, which shall be the second position, and worke by the question as before: if you haue failed againe, note the excesse or want for ỹ is the second error. Then shall you multiply the first position by the secõd error crosse-wise, & againe the second position by the first error (and this must alwaies bée obserued) and you must kéepe the two products: then if the signes be both alike, that is to say either both too much, or both too little, you shall abate the lesser product from the greater, & likewise you shall subtract the lesser error from the greater, and by the remaine of those errors, you shall diuide the residue of ỹ products, the quotiẽt shall be the true

number

true number that you ſéeke. But if the 2 ſignes be vnlike, that is to ſay, the one too much, and the other too little, then you ſhal ad thoſe products together, and likewiſe you muſt ad both ths errors together, and by the Sum of thoſe errors, diuide the totall ſum of both the products : the quotient ſhall be the true number that you doe ſéeke and this is the whole Rule, as by theſe examples following, it will appeare more plaine.

Example.

3 A Man lying at the poynt of death ſaid that hee had in a certaine Coffer 100 duckets, the which he bequethed to 3 of his friēds by him named, after this ſort. The firſt muſt haue a certaine portion. The ſecone muſt haue twiſe ſo many as the firſt abating 8 Duckets: and ỹ third muſt haue thrée times ſo many as the firſt leſſe by 15 Duckets. Now I demand how many euery of them muſt haue

Anſwere.

Anſ. Firſt I doe imagine that the firſt man had 30. Duckets, then by the order of the queſtion, the ſecond ſhould haue 52, & the third 75. Theſe three Summes beeing added together doe make 157, and I ſhould haue but 100 ſo that this firſt errour is to much by 57, then I note apart the firſt poſition 30, with his error 57 too much after this ſort 30, × 57. Therfore I proſecute my worke, & I ſuppoſe that the firſt had 24, then by the order of the queſtion, the ſecond ſhould haue 40, & the third 57: theſe three ſummes being added together, do make 121, and I muſt haue but 100, ſo the ſecond error is too much by 21. Therfore I note 24, × 21, vnder the 30 × 57, which was my firſt poſition with the error as you may ſee in the worke on the next ſide following.

Then I multiply croſſewiſe, 30, (which is the firſt poſition) by 21 which is the ſecond error, and thereof commeth 630. Likewiſe I multiply 24, (which is the ſecond poſition)

by 57, which is the firſt error, and I find 1368: Then becauſe the ſignes of the errors are both like that is to ſay both to much I muſt therfore ſubtract 630 from 1368 and there wil remaine 738 which is the diuident.

630.

30. × 57.

24. × 21.

1368. 36.
630

738.

X1
738

38 8.(20 1/2.
3

Againe I muſt ſubtract the leſſer error from the greater, that is to ſay, 21, out of 57, and there will remaine 36, which ſhall be my diuiſor. This done I diuide 738, by 36, and the quotient will be 20, 1/2.

20 1/2.
33.
46 1/2.
100

The

The which $20\frac{1}{2}$, is the iust number of the Duckets, that the first man had for his part, so consequently the second man had 33 Duckets, and the third $46\frac{1}{2}$, as by the working afore may appeare.

The like number will also appeare in case the erros were both too little, as in making the two positions by 18 and 20, and you shal find that the two erros will bee both too little, & first will bee too little by 15, and the second too little by three, as by perusing this worke, you shall well perceiue.

54.
18 —— 15
20 —— 3.
300. 12
54.
240. 246 (20 $\frac{1}{2}$.
222
1

Againe, if one of the erros were too

much, and the other too little, yet you ſhal haue the true number, as before. As if the two poſitions were 24, and 20, you ſhall find that the firſt errour will bee 21 too much, and the ſecond will be 3 too little. Therefore multiply 24 by 3 croſſewiſe, thereof commeth 72.

Likewiſe multiply 20 by 21, ỹ product will be 420. Theſe two ſummes 72 and 420, you ſhall adde together, for becauſe the ſignes of the errors be vnlike, and they make 492, ỹ which ſhal be your diuidẽd, and againe, adde the leſſer error 3, with ỹ greater error 21, and they make 24, for your diuiſor,



then

then diuide 492 by 24, the quotient will bee 20 $\frac{1}{2}$: as before doth plainely appeare.

And now because you shal not forget this part of the Rule, learne this breefe remembrance following.

The signs both like, subtraction do require
And vnlike signes, addition will desire.

The meaning whereof is thus, if both the errors haue like signes, then must the Diuidend and the Diuisor be made by subtraction, as is taught before, & if those signes be vnlike, thē must you by addition gather the diuidend, and the diuisor, as I haue done in this last example.

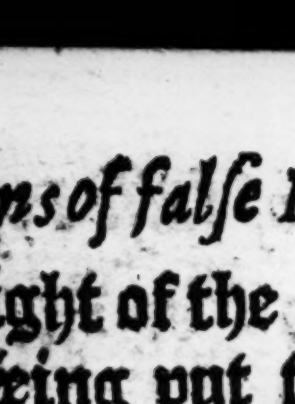
Another Example.

4 A man hath two siluer Cuppes of vnequal waight, hauing to them both but one couer, the waight wherof is 5 ounc. if the couer be put to the lesser cuppe, it will be in double proportion

vnto the waight of the greater, and the couer béeing put to the greater cuppe, it will be in triple proportion vnto the waight of the lesser. I demaund what was the waight of euery cuppe? Answe. Suppose that the lesser cuppe did waigh 7 ounces, then with the couer it must waigh 12 ounces, and this waight should bée in double proportion vnto the greater, therefore the greatest must waigh but 6 Ounces,

adde vnto it 5 ounces for the couer all will bée, 11 ounces, but it should bée 21, for to haue it in triple proportion vnto 7, which representeth

105



90 5

105

90 | 18 (3 ounces.

15 | x

the waight of the lesser cup: So that this

this first error is too little by 10, which you shall note after 7 in this sort, 7, —— 10.

After you shall suppose some other nũber, as 9, and make the like worke as before, so you shall find 15 too little for the second error, which you shall put behind 9 with the signe lesse thus —— 15, & then work with the rest as aboue is said, and you shall find that the lesser Cup weighed three ounces, and consequently the greater Fours Dunces.

---

5 One man demaunded of another in a morning what a clocke it was, ỹ other made him this answere, if you doe adde (sayth hée) the $\frac{1}{4}$ of the houres which bée past since midnight with the $\frac{1}{3}$ of the houres which are to come vntill noone, you shall haue the iust houre, that is to say, you shall know what a clocke it was. Answer. Suppose that it was 4 a clocke in the Morning, so should there remaine 8, vntill noone, then I take the $\frac{1}{4}$ of 4

which is 1, and the $\frac{2}{3}$ of 8 which is 5 $\frac{1}{3}$ and I ad them together, so I find 6 $\frac{1}{3}$, and I supposed but 4 therefore this first erroz is too much by 2 $\frac{1}{3}$, which I note after my position, thus 4 ✕ 2 $\frac{1}{3}$: then againe I suppose another number, that is to say 9, so should remaine but 3 houres vntill nowne. I take the $\frac{1}{4}$ of 9, and the $\frac{2}{3}$ of 3, which is 2 $\frac{1}{4}$ & 2: these I adde together, and they make 4 $\frac{1}{4}$: but I supposed ỹ it was 9, therefoze the second erroz is 4 $\frac{3}{4}$ too little, which I note behind my position thus 9——4 $\frac{3}{4}$.

And then I multiply crosse-wise, as before is taught, & because the signes of ỹ errozs are vnlike, that is to say, the one too much, & the other too little, therfoze in this worke I must adde the products, and they

19.

4 ✕ 2 $\frac{1}{3}$.

9——4 $\frac{3}{4}$.

21. 7 $\frac{1}{12}$.

19.

40.

they wil be 40. Likewise I must add the errors and they be $7\frac{1}{12}$. Then I diuide 40 by $7\frac{1}{12}$, and therof cõmeth 5 houres $\frac{11}{17}$, and that houre it was in the morning.

Chap. 15.

Of diuers Questions extraordinarie, euery one of them containing a gene-*rall Rule for such like Examples.*

1 FIue men deuising of their ages, The first said to the others, that he was 120 yéeres of age: the 2 said if my yéeres were doubled then shold I haue so many yéeres more than the first man, as the first hath now more than I haue: The third said in like manner, if my yéeres were tripled. The 4 said if my yéeres were quadrupled, that is to say, multiplyed by 4: The fift said that if his yéeres were quintupled, that is to say, multiplyed by 5, that they should each of thẽ haue so many yéeres more than ỹ first man as

as he hath now more than euery one of thē. The question is to know, how old euery of the other 4 men were?

Anſ. You muſt take the numbers which are néereſt collaterals, in naturall order vnto 2, 3, 4, and 5 by reaſon of dupling, tripling, &c. And the greater of euery of the ſaid numbers collaterals, muſt be your denominator, to the leſſer number. As thus the nert collaterall numbers vnto 2, are 1, & 3, which is $\frac{1}{3}$. Likewiſe ỹ nert collateral numbers to 3 are 2 & 4, which is $\frac{2}{4}$. And ſo for 4, are 3 & 5, which are $\frac{3}{5}$, and for 5 are 4, and 6 which bée $\frac{4}{7}$. Then if you will know the ſecond mans age, you muſt ad vnto 120 the $\frac{1}{3}$ of it ſelfe which is 40, al is 160, the ſame you muſt diuide by 2, and therof commeth 80 yéares, and ſo old was the ſecond man. And for to know the age of the third man: You muſt adde vnto 120 his owne $\frac{2}{4}$, that is to ſay, his $\frac{1}{2}$, which is 60, and they make 180. The ſaid ſumme you muſt diuide by 3, & therof commeth 60 yéars

for

foꝛ the third mans age. And after the ſame manner, you ſhall find that the fourth man had 48 yéeres, and the fift had 40 yéeres. The pꝛoofe is very eaſie.

2 A man hauing his eye ſight ſomewhat altered, began to tell and reckon a certaine number of birds to be in all 18. His Companion that had a cléerer ſight, beholding wel the birds: Anſweared him that there were not 18. But ſaid he, if there were twiſe ſo many moꝛe as there are, there ſhould be as many moꝛe aboue 18. as there be now leſſe than 18. The queſtion is to know, how many birdes there were in all? Anſw. You muſt adde vnto 18 his $\frac{2}{4}$, that is to ſay his $\frac{1}{2}$, and thereof will come 27, the which you ſhall diuide by 3, and therof commeth 9. And ſo many birds were there in all.

3 A Dꝛaper hath bought 24 ſoꝛting cloathes, and he hath ſold 100 poũds

worth of the ſame cloathes, vpon the which hée hath gained, as much as 1 Cloth did coſt him. I demaund what 1 of the ſaid Cloathes did coſt him? Anſw. You muſt adde 1 vnto 24, and they make 25. Then diuide 100 by 25, and therof will come 4 li. and ſo much did one cloth coſt him.

4 A Mayd carried egges vnto the Market, and it happened a merry fellow to méete her, who began to ieſt with her in ſuch ſort, that hée ouerthrew her Baſket, and brake all her egges, the Mayde béeing much diſpleaſed with him for breaking of the ſame, ſaid very earneſtly vnto him, ỹ he ſhould pay for them: the man conſidering with himſelfe, that by his folly they were brokẽ, anſwered ỹ maid that hée would pay her for them, and therefore hée demaunded of her what nũber ſhe had? The ſilly poore wench that could not well reckon, ſayd vnto him, that ſhée could not well tel him, but ſayd ſhée, when I did put them,

into

into my Basket by 2 and by 2, there remained 1 egge: and when I counted them by 3 and by 3, there remained 1: and when I did reckon them by 4 and by 4, there remained still 1: but when I did count them by 5 and by 5, there remained none. The question is to know, how many Egges the mayde had in all? Answere. For to doe this, and all such like questions, you must multiply 2, 3, & 4 together: saying 2 times 3 make 6, and 6 times 4 make 24, vnto this number you must adde 1, and they make 25. And so many egges she had in all. But if she had had a greater number of eggs that she might haue counted them til she came to 7 & 7, after ỹ same manner as she did, til she came to 5 and 5, you must multiply these numbers 2, 3, 4, 5, and 6 the one by the other, and thereof will come 720, vnto ỹ which adde 1, and they make 721. And so many egges she should haue had, if she had counted them by 7 and 7.

5. Againe,

5 Againe, if she had said, that when she counted her eggs by 2, & by 2 there remained 1, and by 3 and 3, there remained 2, and by 4 & 4, there remayned 3, and by 5 and 5, there remained nothing. The question is to know, how many egges shée should haue had? Answ. You must find a number ỹ leaſt that you can possible, which may be diuided by 2, by 3, and by 4, that is to say, 12 is the nérest number, diuide the same by 5, & there remaineth 2. This béeing done, you must find 2 numbers the least that is possible, which may be diuided by 5, & by 2, in such sort that ỹ nũber which is diuided by 2 may exceéd (the other that is diuided by 5) onely by 1, and those 2 numbers are 10, and 6, for if you diuide 6 by 2, your quotient will be 3, and 10 diuided by 5, bringeth but 2: then consider, that 6 cõtaineth 3 times 2, and therfore you must multiply 12 by 3, & they make 36, from ỹ which you must subtract 1, and there will remaine, 35, which is the nũber

that

that is required to be found.

6 And if shée had counted them after the same manner vnto 7, and that there had remained nothing then ye know that 60 is the néerest number that may be diuided by 2, 3, 4, 5, & 6, the which 60 being diuided by 7 there wil remaine 4, and therfore you must find two numbers the least that may be, that can be diuided by 4, & by 7, in such sort, that that number which is diuided by 4, may excéed the other number (by 1,) that is diuided by 7, the which 2 numbers are 7, and 8, for if you diuide 8 by 4 your quotient wil be 2. And diuiding 7 by 7, your quotient wil be 1, and therfore for because that 8 cõtaineth 2 times 4, you must multiply 60 by 2, and thereof cõmeth 120, from the which nũber you shall subtract 1, and the residue which are 119, is the number that is required.

7 A Théefe entring into a Garden, did steale from thence a certen number

ber of Apples: And at his comming forth, he did méet with 3 men, one after another, who threatned to accuse him: and for to appease them, he gaue vnto the first the ½ of all his appeles, who receiued the same with thanks, but he returned him 12 of them back againe. Then he gaue vnto the secõd the ½ of them that he had remaining, who receiued the same, but hee gaue him backe againe 7 apples: and so he gaue vnto the 3 man, the ½ of the residue who returned him 4. And in the end he had still remaining 20 apples. The question is to know, how many apples hé gathered in the sayd Garden? Answ. For to do this, you shal substract 4 from 20, and there wil remaine 16, the same you shal double, & they make 32: from ỹ which you must abate 7, and there wil remaine 25: ỹ same you shall double, and they make 50: from the which you shall substract 12, and there will remaine 38, whereof the double which is 76 doth shew the number of apples that hé gathered.

red. This and ſuch like queſtions are eaſie to bée done in going backwards from the end of the queſtion vntill you come to the beginning thereof. But if he had giuen the $\frac{1}{3}$ vnto one of them, the $\frac{1}{2}$ vnto another, and $\frac{1}{4}$ vnto the laſt, or any other, all the ſame may be done by the conuerſe rule, ỹ is to ſay, beginning at the end of the queſtion, till you come to the beginning as before is ſaid.

8 A Marchant did ride vnto thrée ſeuerall faires: at the firſt hé doubled his money and ſpent 10 crownes, at the ſecond faire he did alſo double his money and ſpent 10 Crownes: And likewiſe at the 3 faire, hé did double his money and ſpent 10 Crownes, & in the end, hé found that hee had remaining but 2 crowns. The queſtiõ is to know, how many Crownes hé had at ỹ firſt: Anſw. for to do this, you muſt adde vnto 10 crownes, the two crownes which hé had remaining, and they make 12, whereof you ſhall

take the ½ which is 6: againe adde 6 vnto 10, and they make 16, whereof you ſhall take the ½, which is 8: finally, you ſhall adde 8 vnto 10, and they make 18, whereof you muſt take the ½ which is 9: and ſo he had 9 crowns at the firſt.

9 A Burgeſſe would diſtribute a certaine ſumme of pence vnto diuers poore men equally: but after that hée had counted how many they were in number, he perceiued that if he ſhold giue vnto euery man 6 d. hée ſhould want 14 pence: But if he ſhould giue euery man 5 d. the péece, hée ſhould haue 9 pence remaining. The queſtiõ is to know the number of ỹ poore men. Anſw. For to doe this, and ſuch like queſtions, you muſt haue in remembrance this principle, more frõ more, or leſſe from leſſe, &c. which is ſet out in 2 verſes in the Rule of falſe poſitions, that is to ſay, you muſt adde the leſſe with the more. Namely, 14 with 9, and they make 23: and diuide the

ſame

ſame ſum by the difference which is of 5 from 6 that is 1. And therefore you muſt diuide 23 by 1, but 1 doth neither multiply nor diuide, therfore you may conclude, and ſay that there were 23 poore men.

10 And if hée ſhould giue to euery man 5 pence, he ſhould haue 19 pence remaining, and giuing euery man 7 d he ſhould haue 3 pence ouer: In this caſe you muſt abate more from more, that is to ſay, 3 from 19 and the reſt which is 16, you muſt diuide by 2, which is the difference of 5 from 7: & the quotient which is 8, doth ſhew you the nũber of the poore men: and likewiſe if y he had had both wants, that is, if both the numbers had béene to little, you muſt haue done with thẽ as you did with the others that were both more.

11 A man hath giuen vnto 20 worth folks 20 ſ. that is to ſay, vnto men, women, and boyes: vnto men he gaue 20 pence a péece, vnto women 15 d. and vnto boyes he gaue 8 pence. The

question is to know, how many men, how many womẽ, & how many boies there were in all? Answe. First you must take the difference of 8 from 15, and also from 20: and you shall haue 7 for the difference of the woman: and 12 for that of the man: this done, you may suppose that there were 20 boies the which at 8 pence the péce maketh 160: the which you must abate from 20 s. being reduced into pence, that is from 240 pence, & there will remaine 80 pence, the which 80 you shall diuide into 2 such parts that ỹ one may be diuided by 7, & the other by 12, and that nothing may remaine after the diuisions are made. The which 2 nũbers are 56, and 24: For 56 being diuided by 7, bringeth into the quotient 8, and 24 being diuided by 12, will bring into the quotiẽt 2: which sheweth that there was 8 women, 2 men. And the rest of the 20, which are 10, were boyes, so there were 8 women, 2 men, and 10 boyes. Some men do call this Rule, the virgins Rule.

Chap.

Chap. 16.
Of ſports and paſtime, done by *Number*.

IF you would know that number that any man doth thinke, or imagine in his mind as thogh you could deuine,

Bid him triple the ſame number, then of the product let him take the $\frac{1}{2}$, if the number be euen or els the greater halfe, if the ſame be odde, then bid him triple againe the ſaid $\frac{1}{2}$: after ſay to him, that he ſhal put away if he can 3 6, 27, or 9, from the laſt number being tripled: that is to ſay, cauſe him ſubtilly to put away 9, as many tims as is poſſible, & kéepe the number ſecretly: and when he can no more take away 9: then to know if ỹ yet there remaine any number, bid him abate 3, 2, or 1, if he can: this done, ſée how many times 9 you haue cauſed him to abate, for the which kéep you in mind

ſo many times 2, & if that you know that hée had any thing remaining beſides the nines, the ſame ſhall alſo note vnto you 1.

Example.

Suppoſe that hée thought 6 which being tripled is 18, wherof the ⅓ is 9 the triple of that is 27: now cauſe him to abate 18, or 9 or 27: and againe 9, but then he will ſay vnto you that he cannot, bid him thē abate 3, or 2 or 1, he will ſay alſo that he cānot wherfore conſidering that you haue made him to abate 3 times 9 iuſtly, you ſhall tell him that he thought 6, for 3 times 2 maketh 6. If he had thought 5 the triple therof is 15, whereof the greater ⅓ is 8, the triple of that maketh 24 which containeth two times 9, they are worth 4, and the remaine ſignifieth 1, the which added together make 5 which is the nūber that he thought.

2 If in any company, one of them hath a Ring vpon his finger, and you would

would know by manner of deuining who hath the same & vpon what finger and what ioynt: cause the persons to sit downe in order, and kéepe likewise an order of thée fingers: thē separate your selfe from them in some certain place, and say vnto one of the lookers on, that he double the number (marking well in your mind the order) of him that hath the King: and vnto the double bid him adde 5, and then cause him to multiply this addition by 5, & vnto the product bid him ad the number of the finger of the person which hath the King: Suppose that the same last summe did amount to 89, then afterward say to him, that hée put after the same last nūber toward his right hand, a figure signifying vpon which of the ioynts hee hath the King, as if it be vpon the third ioynt, let him put 3 after 89, and it will be 893, this done you shall aske him what number hée kéepeth, from the which you shall abate 250, & you shall haue thrée figures remaining at the

leaſt. The firſt toward your left hand ſhall ſignifie the number of the perſon which hath the Ring. The ſecond or middle figure ſhall repreſent the number of the finger. And the laſt figure toward your right hand, ſhall betoken the number of the ioynt. As if the number which he did kéepe were 883 from that you ſhall abate 250, & there will remaine 643, which do note vnto you, that the firſt perſon hath the Ring vpon the 4 finger, and vpon his third ioynt.

But note that when you haue made your ſubſtraction, if there do remaine a cipher in the place of tens, that is to ſay, in the ſecond place, you muſt then abate 1 from that figure which is in ỹ place of hundreds, that is to ſay, from the figure which is next your left hād, and that ſhall bee worth 10 tenths, ſignifying the tenth finger: as if there ſhould remaine 703, you muſt ſay, that the firſt perſon (vpon his tenth finger, and vpon his third ioynt (hath the Ring.

3 And after the same maner, if a man doe cast thrée dice, you may know the points of euery one of them, for if you do cause him to double the points of one die, and vnto the double to add 5, and the same Sum to multiply by 5, and vnto the product ad the points of one of the other dice, & behind that number toward the right hand, to put the figure which signifieth the poynts of the last die, and then shall you aske him what nũber he kæpeth, from the which abate 250, and there will remaine 3 figurs: which do note vnto you the points of euery die.

4 Likewise, if thrée of your companions, to say, Peter, James, & John would (in your absence) giue themselues euery one a contrarie name: as forexample: Peter wold be called a King, James a Duke, and John a County: And you wold deuine which of them is called a King, which the Duke, and which the County. Take 24 stones, or other pæces whatsoeuer and giue vnto Peter 1, vnto James 2, and

2, & vnto John 3, or otherwise. But marke well vnto which of them you haue giuen 1, vnto which 2, and vnto whom 3. Then leauing the 18 stones (before them) that are remaining, you shall absent your selfe from their sight, or else turne your face from them, saying thus vnto them: whosoeuer nameth himselfe a King, for euery stone that I gaue him, let him take 1 of the residue; and hée that nameth himselfe a Duke, for euery stone that I gaue him, let him take 2 of thē that remaine; and he that calleth himselfe a County, for euery stone that I gaue him, let him take 4: this being done, approach néere them, and marke how many stones are remaining: & know this, that there cannot remaine any other number, but one of these fiue, 1, 2, 3, 5, 6, 7, for the which six numbers we haue chosen to euery of them a seuerall name which are these: *Angeli, Beati, Talister, Messias, Israel, Pietas*: each of them containing thrée vowels *a, e, i*, which doe shew the names by order:

order: That is to say, the vowell *a*, sheweth which is the King, the vowell *e*, telleth which is the Duke, and the vowell *i*, sheweth which is the Countie: in following the order how, and to whom you haue giuen one stone, to whom 2, & to which 3, then if there do remain but one stone, ỹ first name *Angeli*, (by these 3 vowels, a, e, i,) sheweth that Peter is King, James the Duke, and John the County. And if there do remaine 2 stones, ỹ second name *Beati*, shall shew you by these 3 vowels a, e, i, that Peter is ỹ Duke, James the King, & John the County. And so of the other, as by this table doth plainely appeare.

1	2	1	2	3	3
2	1	3	3	1	2
3	3	2	1	2	1
a	e	a	e	i	i
e	a	i	i	a	e
i	i	e	a	e	a
1	2	3	5	6	7
A	B	T	M	I	P

FINIS.

The agreement of the measures, & Waights of diuers Countries, the one with the other, being reduced *to an equality, and drawne into Tables, as followeth.*

London.

100 elles at London doe make at

Antwarpe	166 $\frac{2}{3}$
Nuremberge.	174 $\frac{1}{6}$
Franckf. Liebsig. & Pzeslaw	208 $\frac{1}{3}$
Dantzicke.	138 $\frac{1}{3}$
Vienne in Austri.	145.
Lyons in France.	101 $\frac{2}{3}$ aulnes.
Paris in France.	095
Rouan in Nozm.	086 $\frac{2}{3}$.
Lichburne.	100. bares.
Siuell & other places in spay.	135.
The Isle of Madere.	103 $\frac{1}{3}$.
Venice.	180 bzaces.
Lucques.	200 bzaces.
Flozence.	204 $\frac{1}{6}$ bzaces.
Millan.	230.
Geanes.	480 $\frac{5}{6}$ paulms

The like agreement hath 125 yards, vnto the measures aforesaid.

The agreement of the measure at *Antwarpe, with the measures at other places.*

Antwarpe.

100 elles at Andwarpe, do make at

London, yards	75, & 60 elles.
Nuremberge,	104 ½
Franckeford, &c.	125
Dantzicke,	83.
Wienne, &c.	87.
Lyons,	60 aulnes.
Paris,	57.
Rouan,	52.
Lisbonne,	60 vares.
Spuell, &c.	81.
The Illes, &c.	62.
Venice,	108 braces.
Lucques,	120.
Florence,	122 ½.
Millan,	138.
Geanes,	288 ½ paulms.

The agreement of the measure at *Nuremberge, with the measures at other places.*

Nuremberge.

100 elles at Nuremberge, doe make at	London,	57 $\frac{2}{5}$ elles.
	Andwarpe,	95 $\frac{3}{5}$
	Franckford, &c.	119 $\frac{3}{5}$
	Dantzicke,	79 $\frac{2}{2}$
	Vienne, &c.	83 $\frac{1}{4}$
	Lyons,	58 $\frac{2}{3}$ aulnes.
	Paris,	54 $\frac{1}{2}$
	Rouan,	49 $\frac{3}{4}$
	Lishborne,	57 $\frac{2}{5}$ vares.
	Syuell, &c.	77 $\frac{1}{2}$.
	The Iles of Wadere,	58 $\frac{1}{3}$.
	Venice,	103 $\frac{1}{3}$ braces.
	Lucques,	114 $\frac{4}{5}$.
	Florence,	117 $\frac{1}{5}$.
	Millan,	132.
	Geanes,	276 paulmes.

The agreement of the measure at *Franckeford, &c. with the measures at other places.*

Franckeford, &c.

100 elles at Franckforde, &c. doe make at

London,	48 elles.
Antwarpe,	80
Nuremberge,	83 3/5.
Dantzicke,	66 2/3.
Vienne, &c.	69 3/5.
Lions,	58 4/5 aulnes.
Parris,	45 3/5.
Rouan,	41 3/5.
Lichborne,	48 bares.
Sivell,	64 4/5.
The Illes &c.	49 3/5.
Venice,	86 2/5 braces.
Lucques.	96.
Florence,	98
Millan,	110 2/5.
Geanes,	230 4/5 paulmes.

The agreement of the measure at *Dantzicke, &c. with the measures at other places.*

Dantzicke.

100 elles at Dantzicke doe make at

London,	72 1/4	elles.
Antwarpe,	120 1/2	
Nuremberge,	125 7/8	•
Franckford.	150 5/8	•
Vienne, &c.	107 1/2	•
Lions,	73 1/2	aulnes.
Parris,	68 5/8	•
Rouan,	62 5/8	•
Lisbonne,	72 1/4	vares.
Siuell, &c.	97 1/2	•
The Isles &c.	74 5/8	•
Venice,	130	braces.
Lucques.	144 1/2	•
Florence,	147 1/2	•
Millan,	166 1/4	•
Geanes,	347 1/2	pauimes.

The agreement of the measure at *Vienne, with the measures at other places.*

Vienne in Austrice.

100 elles at Vienne doe make at

London,	68 9/10	elles.
Antwarpe,	114 9/10.	
Nuremberge,	120.	
Franckford. &c.	143 5/6.	
Dantzicke,	95 3/5.	
Lions,	70 1/10	aulnes.
Parris,	65 1/2.	
Rouan,	59 3/4.	
Lisbonne,	68 9/10	vares.
Siuell, &c.	93 1/10.	
The Iles &c.	71 1/4.	
Venice,	124 1/5	braces.
Lucques.	137 9/10.	
Florence,	140 4/5.	
Millan,	158 3/5.	
Geanes,	331 1/5	paulmes.

The agreement of the measure at *Lyons, agreeing with the measures at other places.*

Lyons.

100 aulnes at Lyons, doe make at

London,	98 1/3	elles.
Andwarpe,	163 7/8	•
Nuremberge,	171 1/4	•
Franckeford, &c.	204 5/6	•
Dantzicke,	136.	
Vienne,	142 1/2	•
Paris,	93 2/5	• aulnes.
Rouan,	85 1/4	•
Lithbozne,	98 1/3	vares.
Syuell,	132 3/4	•
The Iles, &c.	101 3/5	•
Venice,	177	braces.
Lucques,	296 2/3	•
Florence,	200 3/4	•
Millan,	226 1/5	•
Geanes,	472 7/8	spaulmes.

The agreement of the measure at *Paris, with the measures at other places.*

Paris.

100 aulnes at Paris doe make at

London,	105 $\frac{7}{4}$ elles.
Antwarpe,	175 $\frac{2}{1}$.
Nuremberge,	183 $\frac{1}{3}$.
Franckford. &c.	219 $\frac{1}{4}$.
Dantzicke,	145 $\frac{3}{5}$.
Vienne,	152 $\frac{3}{5}$.
Lions,	107 aulnes.
Rouan,	91 $\frac{1}{3}$.
Lichbonne,	105 $\frac{1}{4}$ vares.
Siuell, &c.	142.
The Illes &c.	108 $\frac{3}{4}$.
Venice,	189 $\frac{2}{7}$ braces.
Lucques.	210 $\frac{1}{2}$.
Florence,	214 $\frac{7}{3}$.
Millan,	242.
Geanes,	506 $\frac{1}{8}$ paulmes.

The agreement of the measure at *Rouan, with the measures at other places.*

Rouan.

100 aulnes at Rouan, doe make at

London,	115 3/8	elles.
Andwarpe,	192 1/4	•
Nuremberge,	200 7/8	•
Franckeford, &c.	240 3/8	•
Dantzicke,	159 5/8	•
Vienne,	167 1/4	•
Lyons,	117 1/4	• aulnes.
Paris,	109 3/4	•
Lishborne,	115 3/8	• vares.
Syuell,	155 1/4	•
The Iles, &c.	119 1/5	•
Venice,	207 1/7	vraces.
Lucques,	230 3/4	•
Florence,	235 1/2	•
Millan,	265 3/8	•
Geanes,	554 4/7	paulms.

The agreement of the measure at *Lisbburne, with the measures in other places.*

Lishburne.

100 vares at Lishburne, doe make at	London,	100 elles,
	Antwarpe,	196 2/3.
	Nuremberge,	174 1/6.
	Franckford, &c.	208 1/3.
	Dantzicke,	138
	Vienne,	145.
	Lyons,	101 2/3. aulnes.
	Paris,	095.
	Rouan,	086 1/3.
	Diuell, &c.	135 vares.
	The Iles, &c.	103 1/3.
	Venice,	180 braces.
	Lucques,	200.
	Florence,	204 1/6.
	Millan,	230.
	Geanes	480 5/6 paulmes.

The agreement of the measure at *Siuell, with the measures at other places.*

Siuell &c.

100 vares at Siuell, do make at

London,	74	elles.
Antwarpe,	123 7/16	
Naremberge,	129	
Franckford, &c.	154 5/19	
Dantzicke.	102 7/16	
Vienne,	107 3/4	
Lyons,	75 1/4	aulnes.
Paris,	70 3/8	
Rouan,	64 1/8	
Lilhburne,	74	vares.
The Iles, &c.	76 1/4	
Venice	133 1/2	braces.
Lucques.	148 1/8	
Florence,	151 3/16	
Millan.	170 3/8	
Geanes.	356 1/4	paulmes.

The agreement of the measure at *the Isles of Madere, with the measures at other places.*

The Isles of Madere.

100 vares at ỹ Isles of Madere do make at

London,	96 1/4	elles.
Antwarpe,	161 1/4	•
Nurembergue,	168 1/4	•
Franckford, &c.	201 1/2	•
Dantzicke,	133 5/6	•
Vienne,	140 2/3	•
Lyons,	98 1/3	aulnes.
Paris,	91 7/8	•
Rouan,	83 5/6	•
Lichburne,	96 1/4	vares.
Siuell, &c.	130 3/7	•
Venice,	174	braces.
Lucques,	193 1/2	•
Florence,	197 1/2	•
Millan,	222 1/7	•
Geanes	465 1/4	paulmes.

The agreement of the measure at *Venice, with the measures at other places.*

Venice.

100 braces at Venice, do make at

London,	55 ½.	elles.
Antwarpe,	92 ½.	
Nurenberge,	96 ¼.	
Francfort, &c.	115 ¾	
Dantzicke.	76 ½.	
Vienne,	80 ½.	
Lyons,	56 ¼.	aulnes.
Paris,	52 ¼.	
Rouan,	48 ½.	
Lichburne,	55 ½.	bares.
Sivell, &c.	75.	
The Iles, &c.	57 ½.	
Lucques.	111	braces.
Florence,	113 ⅔.	
Millan.	127 ¾.	
Geanes.	267 ⅛	paulmes.

The agreement of the measure at *Lucques, with the measures at other places.*

Lucques.

	London,	50 elles.
	Antwarpe,	83 ½.
	Nuremberge,	76.
	Franckford, &c.	104 ½.
	Dantzicke,	69 ½.
	Vienne,	72 ½.
	Lions,	50 ⅚ aulnes.
100 braces at Lucques, doe make at	Paris,	47 ½.
	Rouan,	43 ½.
	Lisbourne,	50 vares.
	Siuell, &c.	67 ½.
	The Isles &c.	51 ⅔.
	Venice,	90 braces.
	Florence,	102.
	Millan,	115.
	Geanes.	240 ½. paulmes.

The agreement of the measure at *Florence, with the measures at other places.*

Florence.

100 braces at Florence, doe make at	London	49 elles.
	Antwarpe	81 3/5.
	Nuremberge.	85 1/4.
	Franckeford. &c.	102.
	Dantzicke.	67 3/4.
	Vienne,	71.
	Lyons,	49 3/4 aulnes.
	Paris,	46 1/2.
	Rouan,	42 2/5.
	Lichburne.	49 vares.
	Sivell &c.	42 2/5.
	The Illes &c.	50 3/5.
	Venice.	88 1/2.
	Lucques.	97 7/8.
	Millan.	112 3/7.
	Geanes	235 1/2.

The agreement of the measure at *Millan, with the measures at other places.*

Millan.

100 braces at Millan, doe make at

London,	43 3/5	elles.
Antwarpe,	72 2/3	
Nuremberge,	75 1/2	
Franckford, &c.	90 1/2	
Dantzicke,	60 1/8	
Vienne,	63	
Lions,	44 3/7	aulnes.
Paris,	41 1/4	
Rouan,	37 2/3	
Lishburne,	43 3/7	vares.
Siuell, &c.	58 2/3	
The Iles &c.	44 1/8	
Venice,	78 1/4	braces.
Lucques,	86 7/8	
Florence,	88 3/4	
Geanes.	290	paulmes.

The agreement of the measure at *Geanes, with the measures at other places.*

Geanes.

London	20 ¾	elles.
Antwarpe	34 ⅗.	
Nuremberge.	36 ⅔.	
Franckeford. &c.	43 ⅙.	
Dantzicke.	28 ¾.	
Vienne,	30 ⅛.	
Lyons,	21 ⅛	aulnes.
Paris,	19 ¼.	
Rouan,	18.	
Lishburne.	20 ¾.	vares.
Siuell &c.	28.	
The Iles &c.	21 ⅔.	
Venice.	37 ⅔.	braces.
Lucques.	41 ½.	
Florence.	42 ⅔.	
Millan.	47 ¾.	

100 palmes at Geanes doe make at

The agreement of the Waights of diuers Cuntries, the one with the other *being reduced to an equality, & drawn into Tables, as followeth.*

London.

Andwarpe,	107 5/8
Franckford,	99.
Collen & Aulberge,	102 1/4
Nuremberge,	100 1/2
Rouan,	098.
Lions,	118 1/2
Paris,	102 1/4
Diepe,	100 1/4
Geneua,	90 3/8
Toulouse,	122 3/4
Rochell,	124 7/8
Marseilles,	124 1/4
Siuill, &c.	109 3/4
Venice sut: wai.	166 7/8
Venice groll wa:	105 3/8
Aquilla,	157 1/4
Vienne,	89 3/8
Pzeslawe,	134 5/8
Liebzig,	101 1/4
Dantzig,	129 1/4
Luberk,	97 3/8
Barcellone,	143 1/2
Lisbburne, &c.	99.
Geanes.	157 1/4

112 li. waight at London, doe make at

The agreement of the waight at Antwarpe, with the waights *at other places.*

Antwarpe.	
London,	104 li.
Franckefoord,	91 7/8.
Collen &c.	94 7/8.
Nuremberge,	093.
Rouan,	091.
Lyons,	110.
Paris,	96 1/4.
Diepe,	93.
Geneua,	84.
Toulouse,	114.
Rochell,	116.
Marseilles,	115 1/4.
Diuell,	101 7/8.
Venice, &c.	155.
Venice, &c.	97 3/4.
Aquilla,	146.
Vienne,	83.
Pzeslaw,	125.
Liebzig,	94.
Dantzig,	120.
Lubecke,	90 1/4.
Barcellone,	133 1/4.
Lichburne,	84 1/2.
Geanes.	146.

100 li. waight at Antwarpe doe make at

The agreement of the Waights at Franckeford, with the waights *at other places.*

	Franckeford.
London,	113 1/2.
Andwarpe,	108 3/4.
Collen &c.	103 1/4
Nuremberge,	102 1/8.
Rouan,	099.
Lions,	119 5/8.
Paris,	103 1/4.
Diepe,	101 1/4.
Geneua,	91 1/4.
Toulouse,	124.
Rochell,	126 1/8.
Marseilles,	125 1/2.
Sicill, &c.	110 3/4.
Venice sut: wai.	168 1/2.
Venice groll wa:	106 1/2.
Aquilla,	158 1/4.
Vienne,	90 1/4.
Pzeslawe,	135 7/8.
Liebzig,	102 1/4.
Dantzig,	130 1/2.
Luberck,	98 1/4.
Barcellone,	144 7/8.
Lichburne, &c.	100.
Geanes.	158 3/4.

100 li. waight at Fräckfozde, doe make at

The agreement of the waight at Collen and at Aulsberge, with the *waights at other places.*

At Collen, and Aulsberge.

London,	109 ½.
Antwarpe,	105 ¼.
Franckeford,	96 ¾.
Nuremberge,	97 ⅞.
Rouan,	95 ¾.
Lyons,	115 ⅞.
Paris,	100.
Diepe,	98.
Geneua,	88 ½.
Toulouse,	120.
Rochell,	122 ⅛.
Marseilles,	121 ½.
Niuell,	107 ½.
Venice, &c.	163 ½.
Venice, &c.	103.
Aquila,	153 ¾.
Vienne,	87 ¼.
Pzeslaw,	101.
Liebzig,	99.
Dantzig,	126 ⅛.
Lubecke,	95 ¼.
Barcellone,	140 ¼.
Lichburne,	96 ¾.
Geanes.	153 ¾.

100 lt. waight at Collen and Aulberge, doe make

The agreement of the Waight at Nuremberge, with the waighes *at other places.*

Nuremberge.

London,	110 3/4.
Antwarpe,	107 1/2.
Franckford. &c.	98 7/8.
Collen &c.	102.
Rouan,	97 7/8.
Lions,	118 3/4.
Paris,	102.
Diepe,	100 1/8.
Geneua,	90 1/4.
Toulouse,	122 3/8.
Rochell,	124 5/8.
Marceilles,	124.
Stuell,	109 1/8.
Venice, &c.	166 5/8.
Venice, &c.	105 1/8.
Aquilla,	157.
Vienne,	89 1/4.
Pzeslaw,	134 3/8.
Liebzig,	101 1/8.
Dantzicke.	129.
Lubecke,	97 1/4.
Barcellone,	143 1/4.
Lichbozne,	98 7/8.
Geanes,	157.

100 li. waight at Nuremberge, doe make at

The agreement of the Waights at Rouan, with the waights *at other places.*

100 li. waight at Rouan, do make at	Rouan.
	London, 114 1/4.
	Andwarpe, 109 7/8.
	Franckeford, 101.
	Collen, &c. 104 1/2
	Nuremberge, 102 1/2.
	Lyons, 120 7/8.
	Paris, 104 1/4.
	Diepe, 102 3/4.
	Geneua, 92 1/4.
	Toulouse, 125 1/4.
	Rochell, 127 1/4.
	Marcellis, 126 3/4.
	Syuell, 112.
	Venice, &c. 170 1/4.
	Venice, &c. 107 1/2.
	Aquilla, 160 1/4.
	Vienne, 91.
	Pzeslaw, 137 1/4.
	Liebzig, 103 1/4.
	Dantzicke, 131 7/8.
	Lubecke, 99 3/4.
	Barcellone, 146 1/4.
	Lishbozne, 101.
	Geanes, 160 1/4.

The agreement of the Waight at Lyons, with the waights *at other places.*

	Lyons.	
	London,	94 3/12
	Antwarpe,	90 7/8
	Franckford. &c.	83 1/2
	Collen &c.	86 1/4
	Nuremberge,	84 1/12
	Rouan,	82 1/2
	Paris,	65 1/4
	Diepe,	84 1/12
	Geneua,	76 1/4
100 li. waight at Lyons, doe make at	Toulouse,	103 1/2
	Rochell,	105 1/8
	Marceilles,	104 3/4
	Siuell,	92 1/2
	Venice, &c.	140 3/4
	Venice, &c.	88 5/8
	Aquilla,	132 1/2
	Vienne,	75 1/4
	Pyeslaw,	113 1/2
	Liebzig,	85 1/4
	Dantzicke.	109.
	Lubecke,	82.
	Barcellone,	121.
	Lichbozne,	83 1/4
	Geanes,	132 1/2

The agreement of the Waights at Paris, with the waights *at other places.*

	Paris.
London,	109 1/2.
Andwarpe,	105 1/4.
Franckefoꝛd,	96 3/4.
Collen, &c.	102 1/4
Nuremberge,	97 7/8.
Rouan,	95 3/4.
Lyons,	115 7/8.
Diepe,	98.
Geneua,	88 1/4.
Toulouſe,	120.
Rochell,	122 1/2.
Marcellis,	121 1/2.
Syuell,	107 1/4.
Uenice, &c.	164.
Uenice, &c.	103.
Aquilla,	153 3/4.
Uienne,	87 1/4.
Pꝛeſlaw,	131 1/2.
Liebꝛig,	94 1/8.
Dantzicke,	126 1/4.
Lubecke,	95 1/8.
Barcellone,	140 5/8.
Lichboꝛne,	96 3/4.
Geanes,	153 3/4.

100 li. waight at Paris, doe make at

The agreement of the Waight at Diepe, with the waights *at other places.*

	Diepe.
London,	111 1/2.
Antwarpe,	107 1/4.
Franckford,	98 3/4.
Collen, &c.	102.
Nuremberge,	97 7/8.
Rouan,	97 3/4.
Lyons,	118 1/2.
Paris,	102.
Geneua,	90 1/2.
Toulouse,	122 1/2.
Rochell,	124 1/2.
Marcellis,	123 7/8.
Siuell,	109 1/8.
Venice lattle, &c.	166 1/8
Venice grosse, &c.	105.
Aquila,	156 3/4.
Vienne,	89 1/8 1/4.
Pzeslaw,	134 1/4.
Liebzig,	101.
Dantzicke,	128 3/4.
Lubecke,	97 1/8.
Barcellone,	143 1/8.
Lichburne,	98 1/4.
Geanes	156 1/4.

100 li. waight at Diepe, doe make at

The agreement of the Waight at Geneua, with the waights *at other places.*

100 li. waight at Geneua, do make at	Geneua.
	London, 123 3/4.
	Antwarpe, 119 1/8.
	Franckford, 109 1/2.
	Collen, &c. 113 1/8.
	Nuremberge, 110 3/4.
	Rouan, 108 3/8.
	Lyons, 131 7/8.
	Paris, 113 1/8.
	Diepe, 98.
	Toulouse, 135 3/4.
	Rochell, 138 1/8.
	Marcellis, 137 3/4.
	Siuell, 121 3/8.
	Uenice, &c. 184 1/2.
	Uenice, &c. 116 1/2.
	Aquila, 174.
	Uienne, 98 7/8.
	Pzeslaw, 148 7/8.
	Liebzig, 112.
	Dantzicke. 143.
	Lubecke, 107 1/2.
	Barcellone, 158 3/4.
	Lichburne, 109 1/2.
	Geanes. 174.

The agreement of the Waight at Toulouſe, with the waights *at other places.*

	Toulouſe.	
	London,	91 1/4.
	Antwarpe,	87 1/2.
	Franckford,	80 5/8.
	Collen, &c.	83 1/4.
	Nuremberge,	81 7/8.
	Rouan,	79 3/4.
	Lyons,	96 1/2.
	Paris,	83 1/4.
	Diepe,	81 1/2.
100 li.	Geneua,	73 5/8.
waight at	Rochell,	101 1/2.
Toulouſe,	Marcellis,	101 5/8.
do make at	Siuell,	89 3/8.
	Venice ſuttle, &c.	135 7/8.
	Venice groſſe, &c.	81 5/8.
	Aquila,	128.
	Vienne,	72 3/4.
	Pzeſlaw,	109 7/8.
	Liebzig,	82 3/8.
	Dantzicke,	105 1/4.
	Lubecke,	79 1/4.
	Barcellone,	116 7/8.
	Lithburne,	80 5/8.
	Geanes	126 3/4.

The agreement of the Waight at Rochell, with the waights *at other places.*

	Rochell.	
	London,	89 5/8 ♦
	Antwarpe,	86 1/8 ♦
	Franckford,	79 1/4 ♦
	Collen, &c.	81 7/8 ♦
	Puremberge,	80 1/8 ♦
	Rouan,	78 1/4 ♦
	Lyons,	94 7/8 ♦
	Paris,	81 7/8 ♦
	Diepe,	80 1/4 ♦
100 li.	Geneua,	72 1/4 ♦
waight at	Toulouse,	98 1/4 ♦
Rochell, do	Marcellis,	99 1/2 ♦
make at	Siuell,	87 7/8 ♦
	Uenice, &c.	133 5/8 ♦
	Uenice, &c.	84 3/8 ♦
	Aquila,	125 7/8 ♦
	Uienne,	71 1/2 ♦
	Pzeslaw,	107 3/4 ♦
	Liebzig,	81 1/8 ♦
	Dantzicke.	103 1/8 ♦
	Lubecke,	77 7/8 ♦
	Barcellone,	114 7/8 ♦
	Lishburne,	79 1/4 ♦
	Geanes.	125 7/8 ♦

The agreement of the Waights at Marcellis, with the waights *at other places.*

100 li. waight at Marcellis, doe make at	Marcellis.	
	London,	88 1/2 li.
	Antwarpe,	86 1/2 li.
	Franckford,	79 1/2 li.
	Collen, &c.	82 1/4 li.
	Nuremberge,	80 1/2 li.
	Rouan,	78 7/8 li.
	Lions,	95 1/4 li.
	Paris,	82 1/4 li.
	Diepe,	80 1/2 li.
	Geneua,	72 1/2 li.
	Toulouse,	98 1/4 li.
	Rochell,	100 1/2 li.
	Siuell,	88 1/4 li.
	Venice, &c.	134 1/4 li.
	Venice, &c.	84 1/4 li.
	Aquila,	126 1/2 li.
	Vienne,	71 7/8 li.
	Pyeslaw,	108 1/4 li.
	Liebzig,	81 3/8 li.
	Dantzicke,	104 li.
	Lubecke,	78 1/2 li.
	Barcellone,	115 li.
	Lishburne,	79 1/2 li.
	Geanes.	126 1/2 li.

The agreement of the Waight at Siuell, with the waights at *other places.*

	Siuell.
London	102.
Antwarpe	98 1/2.
Franckeford,	79 5/8.
Collen &c.	93 1/8.
Nuremberge,	91 1/8.
Rouan,	89 1/4.
Lyons,	107 7/8.
Paris,	93 1/8.
Diepe,	91 1/4.
Geneua,	82 3/4.
Toulouse,	111 3/4.
Rochell,	113 3/4.
Marcellis,	113 1/4.
Venice, &c.	152.
Venice, &c.	96.
Aquila,	143 1/4.
Vienne,	81 3/8.
Pzeslaw,	122 5/8.
Liebzig.	92 1/4.
Dantzicke.	117 3/4.
Lubecke,	88 5/8.
Barcellone,	130 3/4.
Lishburne, &c.	90 1/8.
Geanes	143 1/4.

100 li. waight at Siuell, do make at

The agreement of the Waight Suttle at venice, with the waights *at other places.*

	Venice suttle waight.
London,	67.
Antwarpe,	64 1/2.
Franckford,	59 1/2.
Collen, &c.	61 1/4.
Nuremberge,	60.
Rouan,	58 5/8.
Lions,	71.
Paris,	61 1/4.
Diepe,	60.
Geneua,	54 1/8.
Toulouse,	73 1/2.
Rochell,	74 3/4.
Marcellis,	74 3/8.
Sivell,	65 3/4.
Venice, &c.	63 1/8.
Aquila,	94 1/8.
Vienne,	53 1/2.
Breslaw,	80 3/4.
Liebzig,	60 5/8.
Dantzicke,	77 5/8.
Lubecke,	58 1/4.
Barcellone,	86.
Lichburne,	59 1/4.
Geanes.	94 1/8.

100 li. waight suttle at Venice, do make at

The agreement of the grosse waight at Venice, with the waights at *other places*.

	Venice grosse waight.
London	106 1/4.
Antwarpe	102 1/8.
Franckeford,	93 7/8.
Collen & Aulberg,	97.
Nuremberge,	95.
Rouan,	93.
Lyons,	112 3/8.
Paris,	97.
Diepe,	95 1/8.
Geneua,	85 3/4.
Toulouse,	116 3/8.
Rochell,	118 1/2.
Marcellis,	117 7/8.
Sinell,	104 2/8.
Venice, lut. &c.	158 1/4.
Aquila,	149 1/8.
Vienne,	84 3/4.
Przelaw,	127 3/4.
Liebzig.	96.
Dantzicke.	122 5/8.
Lubecke,	92 3/8.
Barcellone,	136 1/8.
Lishburne, &c.	93 7/8.
Geanes	249 5/8.

100 li. grosse waight at Venice, doe make at

The agreement of the Waights at Aquila, with the waights *at other places.*

	Aquila.
London,	71 1/4.
Andwarpe,	68 3/8.
Franckforde,	62 1/8.
Collen &c.	65.
Nuremberge,	63 5/8.
Rouan,	62 1/4.
Lions,	75 1/4.
Paris,	65.
Diepe,	63 1/2.
Geneua,	57 3/8.
Toulouse,	78.
Rochell,	79 3/8.
Marseileles,	79.
Siuill,	69 3/4.
Venice sut:wai.	106.
Venice groff wa:	67.
Vienne,	56 3/4.
Pzeslawe,	85 3/4.
Liebzig,	64 1/4.
Dantzig,	82 1/8.
Luberck,	61 7/8.
Barcellone,	91 1/4.
Lishburne,	62 7/8.
Geanes.	100.

100 li. waight at Aquila, do make at

The agreement of the Waight at Vienne, with the waights *at other places.*

Vienne.

100 li. waight at Vienne, do make at

London,	125 1/4.
Antwarpe,	120 1/4.
Franckeford,	110 3/4.
Collen &c.	100 3/8.
Nuremberge,	112.
Rouan,	109 5/8.
Lyons,	132 1/2.
Paris,	114 3/8.
Diepe,	112 1/8.
Geneua,	101 1/8.
Toulouse,	237 1/4.
Rochell,	139 5/8.
Marseilles,	139.
Sinell,	122 3/4.
Venice, &c.	186 5/8.
Venice, &c.	117 7/8.
Aquilla,	175 7/8.
Pzeslaw,	150 5/8.
Liebzig,	113 3/4.
Dantzig,	144 1/2.
Lubecke,	108 7/8.
Barcellone,	160 1/2.
Lishburne,	110 3/4.
Geanes.	175 7/8.

The agreement of the Waights at Preslawe, with the waights *at other places.*

	Preslawe.	
	London,	83 1/8
	Andwarpe,	79 7/8
	Franckforde,	93 1/2
	Collen &c.	75 1/8
	Nuremberge,	74 1/4
	Rouan,	72 3/4
	Lions,	88.
	Paris,	75 7/8
	Diepe,	74 3/8
100 li.	Geneua,	67 5/8
waight at	Toulouse,	91 1/8
Preslawe,	Rochell,	92 3/4
doe make	Marseileles,	92 1/4
at	Siuill,	81 1/2
	Venice sut: wai.	123 1/8
	Venice groll wa:	78 1/4
	Aquila,	116 3/4
	Vienne,	66 3/8
	Liebzig,	75 1/8
	Dantzig,	96 3/8
	Lubeck,	72 1/4
	Barcellone,	106 1/2
	Lishburne,	73 1/2
	Geanes.	116 3/4

The agreement of the waight at Liebzig, with the waights *at other places.*

	Liebzig.
London,	110 1/2.
Antwarpe,	106 1/4.
Franckefozd,	97 1/4.
Collen &c.	100 7/8.
Nuremberge,	98 7/8.
Rouan,	96 3/4.
Lyons,	117.
Paris,	100 1/8.
Diepe,	99.
Geneua,	89 3/4.
Toulouſe,	121 1/8.
Rochell,	123.
Marſeilles,	122 5/8.
Diuell,	108 7/8.
Venice, &c.	164 3/4.
Venice, &c.	104.
Aquilla,	155 1/4.
Vienne,	88 1/8.
Pzeſlaw,	132 7/8.
Dantzig,	127 5/8.
Lubecke,	96 1/8.
Barcellone,	141 5/8.
Lichburne,	97 3/4.
Geanes.	155 1/4.

100 li. waight at Liebzig, do make at

The agreement of the Waights at Dantzicke, with the waights *at other places.*

100 li. waight at Dantzick, doe make at	Dantzicke.	
	London,	86 5/8.
	Andwarpe,	83 1/4.
	Franckforde,	76 1/2.
	Collen &c.	79.
	Nuremberge,	77 3/8.
	Rouan,	75 3/4.
	Lions,	91 5/8.
	Paris,	79.
	Diepe,	77 1/2.
	Geneua,	69 1/8.
	Toulouse,	94 7/8.
	Rochell,	96 1/2.
	Marseilles,	96 1/8.
	Siuill,	84 7/8.
	Venice sut: wai.	129.
	Venice groff wa:	81 1/2.
	Aquila,	121 5/8.
	Vienne,	69 1/2.
	Przeslawe,	104 1/8.
	Liebzig,	78 1/4.
	Lubeck,	75 3/8.
	Barcellone,	111.
	Lithburne,	76 1/2.
	Geanes.	121 5/8.

The agreement of the Waights at Lubecke, with the waights *at other places.*

100 li. waight at Lubecke, do make at		Lubecke.
	London,	115.
	Andwarpe,	110 $\frac{1}{2}$.
	Franckeford,	101 $\frac{5}{8}$.
	Collen, &c.	105.
	Nuremberge,	102 $\frac{3}{4}$.
	Rouan,	100 $\frac{5}{8}$.
	Lyons,	121 $\frac{5}{8}$.
	Paris,	105.
	Diepe,	102 $\frac{7}{8}$.
	Geneua,	92 $\frac{3}{4}$.
	Toulouse,	126.
	Rochell,	128 $\frac{1}{4}$.
	Marcellis,	127 $\frac{1}{2}$.
	Syuell,	114 $\frac{5}{8}$.
	Venice, &c.	171 $\frac{1}{4}$.
	Venice, &c.	108 $\frac{1}{8}$.
	Aquilla,	161 $\frac{1}{2}$.
	Vienne,	91 $\frac{3}{4}$.
	Pzeslaw,	128 $\frac{1}{4}$.
	Liebzig,	103 $\frac{7}{8}$.
	Dantzicke,	132 $\frac{5}{8}$.
	Barcellone,	147 $\frac{1}{4}$.
	Lishbozne,	101 $\frac{5}{8}$.
	Geanes,	161 $\frac{1}{2}$.

The agreement of the Waight at Barcellone, with the waights *at other places.*

	Barcellone.
London,	78.
Antwarpe,	75.
Franckford. &c.	68 5/8.
Collen &c.	71 1/4.
Nuremberge,	69 3/4.
Rouan,	68 1/4.
Lyons,	82 1/2.
Paris,	71 1/4.
Diepe,	69 3/4.
Geneua,	62 1/2.
Toulouse,	85 1/2.
Rochell,	87.
Marceilles,	86 1/2.
Siuell,	76 3/4.
Venice, &c.	116 1/4.
Venice, &c.	73 3/8.
Aquilla,	109 1/2.
Vienne,	62 7/8.
Pzsslaw,	93 3/4.
Liebzig,	70 1/2.
Dantzicke.	90.
Lubecke,	67 3/4.
Lishbozne,	68 5/8.
Geanes	109 1/2.

100 li. waight at Barcellone, doe make at

The agreement of the Waight at Lishburne, with the waights *at other places.*

	Lishburne.	
100 li. waight at Lishburne do make at	London,	113 1/8.
	Antwarpe,	108 3/4.
	Franckefozd,	100.
	Collen &c.	103 1/4.
	Nuremberge,	102 1/8.
	Rouan,	99.
	Lyons,	119 5/8.
	Paris,	103 1/4.
	Diepe,	101 1/4.
	Geneua,	91 1/4.
	Toulouse,	124.
	Rochell,	126 2/8.
	Marseilles,	125 1/2.
	Siuell,	110 3/4.
	Venice, &c.	168 1/2.
	Venice, &c.	106 3/8.
	Aquilla,	158 3/4.
	Vienne,	90 1/4.
	Pzeslaw,	135 7/8.
	Liebzig,	102 1/4.
	Dantzig,	130 1/2.
	Lubecke,	98 1/4.
	Barcellone,	144 7/8.
	Geanes.	158 3/4.

The agreement of the Waight at Geanes, with the waights at *other places.*

	Geanes.
London	71 ¼.
Antwarpe	68 ⅜.
Franckeford,	62 ⅞.
Collen &c.	65.
Nuremberge,	63 ⅝.
Rouan,	62 ¼.
Lyons,	75 ¼.
Paris,	65.
Diepe,	63 ⅛.
Geneua,	57 ⅜.
Toulouse,	78.
Rochell,	79 ⅜.
Marcellis,	79.
Sinell,	69 ¾.
Venice, &c.	106.
Venice, &c.	67.
Aquila,	100.
Vienne,	56 ¾.
Pzeslaw,	85 ¾.
Liebzig.	64 ¼.
Dantzicke.	82 ⅛.
Lubecke,	61 ⅞.
Barcellone,	91 ¼.
Lishburne,	62 ⅞.

100 li. waight at Geanes, do make at

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FINIS.


LVCRECIA·ROMANA